THE IRON TRADE REVIEW

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# Steel Bar Buyers Begin Making Contracts

## But Price Question Not Positively Settled—Heavy Sale of Lake Ore at Concessions—Low Prices on Pig Iron Encourage Buying

Improvement in sentiment in the trade noted last week continues, and there are more indications of improvement in business, but the volume of orders is not heavy. Concerning bars and some other products, disquieting rumors of price concessions are current.

**Pig Iron**

The making of lower prices has brought out a very fair tonnage of pig iron in some sections, especially in the east, where sales of the week have amounted to from 30,000 to 40,000 tons. A Virginia company, which has been carrying very heavy stocks of pig iron for a number of years, has set out to sell 25,000 tons, has lowered quotations 75 cents on third quarter and 50 cents on fourth quarter deliveries, and has sold from 10,000 to 15,000 tons. Other Virginia makers have not followed the cut. Connecticut buyers are sounding the market on malleable. In the Pittsburg district, malleable has sold at $13.35, valley, the lowest price at which this grade has sold in about two years. An eastern company purchased 3,000 tons of malleable at Pittsburg on a sliding scale basis. A New Jersey stove works purchased 1,500 tons of No. 2X for last half at Buffalo, where $13.50 for that grade is now more freely quoted. The Canadian Car & Foundry Co. has purchased 2,500 tons of basic from a Buffalo concern. Some negotiations for basic are still pending in the east. In the south, the ordinary quotation is now $10.50, Birmingham, for No. 2, and with 265,000 tons of pig iron on hand, the market is weak. The United States Steel Products Co., which is the export concern of the United States Steel Corporation, is low bidder on 1,550 tons of pig iron for Panama canal requirements.

**Iron Ore**

The most important sales of lake iron ore since those of the Snyder interests on April 20 have just been closed at prices slightly below the regular quotations. Those Cleveland ore sellers who are usually very closely associated are feeling more comfortable, but they say they do not expect to make many sales until the entire tonnage offered at cut prices is disposed of. The situation is somewhat clarified, but ores at low prices are still obtainable. The contracts just made are for 400,000 tons of old range non-Bessemer ores, of which 300,000 tons will be delivered during the next three years at Lake Michigan, and 100,000 tons this year at Lake Erie. The Bethlehem Steel Co. is having considerable difficulty in making contracts for ore sufficiently low in phosphorus at the price which it offers —8 cents per unit, delivered—a price which lake ore interests positively refuse to make.

**Railroad Buying**

Although actual contracts from railroads are not numerous, an encouraging feature of the situation is the revocation of the suspension of shipping orders issued by some railroads after the filing of the decision in the freight rate cases by the interstate commerce commission about April 1. Some fair orders for steel ties and track supplies have been placed.

**Structural Steel**

Some extremely low prices for structural steel are being made, although the cutting is apparently confined to fabricating. The Statler hotel, Cleveland, 4,000 tons, has been awarded to the American Bridge Co. at its bid of $142,000, delivered, or $35.50 per ton. The next lowest bidder was $38 per ton. These prices are low, but do not include the erecting costs. The New York telephone exchange, 5,500 tons, has been awarded to Levering & Gerrigues. The contract for the plain material has not been placed. The principal contracts for the battleship New York are 6,218 tons of plates, to Worth Bros., and 2,400 tons of angles and 2,700 tons of plates to the Carnegie Steel Co.

**Bars**

Farm implement makers and other large users of steel bars have finally commenced to cover for the year beginning July 1. Several contracts involving heavy tonnages of steel bars have been placed during the past few days. The tonnage involved is not announced, but it is reported that the orders were placed at the full price of 1.40c, Pittsburg, with the understanding that the buyers will be protected in case of decline. In past years, the bulk of this tonnage was under active negotiation before May 1, but little was done in this direction this year until a few days ago. Reports are heard of price concessions on small lots of steel bars for immediate shipment, but confirmation is lacking. The price question is not considered as finally settled.

**Sheets and Plates**

Manufacturers of blue annealed sheets are meeting very active competition from plate mills, and in some cases have sold No. 10 gage as low as 1.55c, Pittsburg. James J. McAvoy was low bidder on 6,500 tons of cast iron pipe for the Borough of Richmond. The leading interest was low on 3,000 tons at St. Louis. Deep cutting of prices of open-hearth forging billets is reported at Chicago.

# WORLD'S IRON MARKETS

## PITTSBURG

### Some Encouraging Indications, But No Decided Change.

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., May 23.

Interest in the local iron market is centered in the heavier shipments of rails and track supplies to the railroads; the fact that farming implement manufacturers are quietly negotiating for their steel bar requirements for the year beginning July 1, and the more general buying of heavy melting steel at higher prices. In some instances, railroads, which on April 1 ordered shipments of rails and track supplies suspended, are again accepting shipments. Another encouraging feature is that orders for steel ties this month have been heavy, the leading interest having booked orders for several thousand tons. There has been a still further improvement in sentiment, and, while manufacturers do not anticipate heavy buying at this season of the year, a moderate gain in bookings during the next several months is expected. Orders for pipe placed during the week include 27 miles of 8, 10 and 12-inch steel pipe for shipment to Ashland, O., and 30 miles of from 2 to 8-inch steel pipe for delivery in Oklahoma. A fresh inquiry calls for 30 miles of 12-inch steel pipe for West Virginia shipment. Upward of 15,000 tons of heavy melting steel has been sold at $13, delivered, an advance of 50 cents a ton. A large portion of this tonnage has been taken by consumers having large stocks on hand. Jobbers and large buyers of wire nails have been advised that all contracts made some time ago at $1.75, Pittsburg, and under, will be terminated June 1. Malleable pig iron has been sold at a new low price of $13.35, valley. Bids have gone in on 2,500 tons of basic for shipment to Canada, but it is likely that this business will go to Buffalo furnaces. Steel mills are operating on a more satisfactory schedule, orders for billets and sheet bars entered on mill books so far this month showing a slight gain. Shipments of tin plate are slightly heavier than last month. The operating schedule of tin mills does not reflect actual market conditions on account of heavy stocks at some mills against which shipments are now being made. Users of boiler tubes are quietly negotiating for their last half requirements. Contracts against which shipments are now being made will expire June 30.

**Pig Iron.**—Some low prices have been made on malleable pig iron during the week. On Friday of last week, there was a sale of a small lot for prompt shipment at $13.50, valley, a decline of 25 cents a ton. On Monday of this week, an eastern interest closed for 3,000 tons of malleable, to be delivered 500 tons a month over the second half, on a sliding scale basis. A western interest bought 850 tons for early shipment at $13.35, valley, this being the lowest price at which this grade has sold in about two years. The basic pig iron market also attracted considerable attention, although there has not been a great deal of trading. Additional odd lots have been sold at $13.25, valley, and sales have also been made at a slightly lower figure. Consumers of foundry iron are covered to July 1, but will be obliged to buy fairly heavy tonnage for third quarter and last half, or close down their works. At present, $13.75, valley, for No. 2 foundry is regarded as the minimum, although reports of lower prices are heard. In a few instances, consumers of foundry iron have been sounding the market, but there has been no buying for forward delivery. All furnaces continue to ask $15, valley, for Bessemer pig iron, and have declined offers of small tonnages at a lower figure, although sales have recently been made by middlemen at from 15 to 25 cents a ton below this figure. There is little demand for gray forge and this market is weak. Bids have gone in on the inquiry for 2,500 tons of basic for shipment to Canada, but it is likely that this business will go to the Buffalo district. A steel works east of Pittsburg has blown in one blast furnace and it is likely that one or two other non-merchant furnaces will be started shortly. Two merchant stacks in this territory, which were scheduled to go out about the middle of this month, are still on the active list. We quote the market as follows:

(Prompt Shipment.

| | |
|---|---|
| Bessemer, valley | $15.00 |
| Bessemer, Pittsburg | 15.90 |
| Basic, valley | 13.15 |
| Basic, Pittsburg | 14.05 |
| **No. 2 foundry, Pittsburg** | **14.65** |
| Gray forge, Pittsburg | 13.90 |
| Malleable, Pittsburg | 14.25 |

(Third Quarter.)

| | |
|---|---|
| **Bessemer, valley** | **$15.00** |
| **Bessemer, Pittsburg** | **15.90** |
| Basic, valley | 13.25 |
| Basic, Pittsburg | 14.15 |
| No. 2 foundry, Pittsburg | 14.65 |
| Gray forge, Pittsburg | 13.90 |
| Malleable, Pittsburg | 14.25 |

**Ferro-Alloys.**—There is slightly more inquiry for ferro-manganese for delivery over the next three months. A Southern Ohio steel works is in the market for 300 tons and other inquiries involve from 50 to 150-ton lots. Notwithstanding that a local company purchased a carload lot at a very low figure during the past week, most sellers are asking slightly higher prices and will not quote below $37, Baltimore. Inquiry for 50 per cent ferro-silicon is light and prices are weak.

**We quote ferro-manganese at $36.50 to $37, Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburg is $1.95 per ton.**

Fifty per cent ferro-silicon is quoted at $52.75 to $53.75, Pittsburg, for prompt and forward delivery; 12 per cent, $25; 11 per cent, $24; 10 per cent, $23, f. o. b. Jisco and Ashland furnaces. The freight rate to Pittsburg is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

**Plates.**—The market on plates is rather quiet, although in some sections plans are being prepared for new work, which will involve heavy tonnage of plates. Bids have gone in on the Los Angeles, Cal., aqueduct, which will require 4,500 tons of plates, and a contract for the plates will probably be placed with a local mill before the end of the week. No important awards for cars have been placed in this territory and inquiry is rather light. It is expected that definite action will be taken in a few days by the Philadelphia Co., Pittsburg, on the proposed new gas holder to be erected on the North Side, Pittsburg, which will involve from 5,000 to 6,000 tons of plates. All of the larger mills are quoting 1.40c, Pittsburg, as the minimum and there

is less talk of price concessions. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.35c to 1.40c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

**Sheets.**—There has been practically no change in conditions surrounding the local sheet market. New business is light and specifications are not very heavy, although sentiment has improved in some sections. All of the larger mills continue to quote the regular base prices with the exception of blue annealed sheets No. 10 gage, on which most of the mills are now quoting 1.60c, Pittsburg, on account of the keen competition with plate mills. The smaller manufacturers are still shading prices on black and galvanized sheets. We quote prices as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, No. 10 gage, 1.60c to 1.65c; box annealed sheets, No. 28 gage, 2.15c to 2.20c; galvanized sheets, No. 28 gage, 3.15c to 3.20c; painted roofing sheets, 1.50c to 1.55c per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, 2.75c per square for No. 28 gage, 2½-inch corrugation.

**Tin Plate.**—Shipments of tin plate continue heavy, as only in a few exceptional cases have consumers asked that shipments be held up. This market as a whole is reported to be making a slightly better showing than at the beginning of May and the outlook for June and July is bright, heavy specifications having been received for these two months. There are a few more idle mills at present than a month ago, but the operating schedule does not reflect the true condition of the market on account of the large stocks at some mills against which shipments are being made. Ten additional mills at the Shenango plant of the American Sheet & Tin Plate Co., New Castle, Pa., were started this week and this plant, containing 30 tin mills, is now running full time. The base price on tin plate is as follows:

Coke tin plate, 10-pound basis, 14 x 20, $3.70 f. o. b. mill, Pittsburg district.

**Rails and Track Material.**—One of the encouraging features of the local iron trade is the fact that the railroads are buying track supplies more liberally and are specifying against contracts for rails. In some instances, railroads which on April 1 ordered a suspension of shipments against contracts for rails and track materials, are again accepting shipments. In addition to the liberal specifications, some of the larger trunk lines which placed orders for standard rails at the opening of this year are negotiating for additional tonnage, orders for which likely will be placed some time in June. Following the advance of $1 a ton in the price of railroad spikes on April 1, there was a noticeable falling off in orders. During the past 10 days, however, there has been more general buying of spikes at $1.60, Pittsburg. The leading interest has booked a fair volume of light rail tonnage so far this month and has taken orders for several thousand tons of steel ties. We quote the market as follows, the base price on open-hearth rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; track bolts, 2.25c, Pittsburg.

RAILROAD SPIKES.

| | |
|---|---|
| 4½, 5 and 5½ x ⅝ | $1.60 |
| 3, 3½, 4, 4½ and 5 x ½ | .10 |
| 3½, 4 and 4½ x 7/16 | .20 |
| 3, 3½, 4 and 4½ x 3/8 | .30 |
| 2½ x ⅜ | .40 |
| 2½, 3 and 3½ x 7/16 | .60 |
| 2 x ⅜ | .80 |

**Steel.**—Two or three local companies report that orders for semi-finished steel entered on mill books during the first 22 days of this month show a gain over the corresponding period of April, atlhough the tonnage involved in orders passed for entry during this period was not as heavy as for the same period in March. All of the larger mills continue to quote $23 on Bessemer and open-hearth billets and $24 on Bessemer and open-hearth sheet bars. The smaller mills, however, continue to shade these prices on open-hearth steel. Moderately heavy specifications have been received for June shipment and some users are negotiating for third quarter requirements. If specifications continue to come in at the present rate, the month of May will show a fair gain over April. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $23, with the usual extras for size and analysis, and open-hearth rolling billets, $22 to $23. Bessemer sheets and tin bars are quoted at $24, and open-hearth sheet bars are quoted at $23 to $24, f. o. b. Pittsburg or Youngstown, with full freight to destination added. Forging billets are quoted at $28, Pittsburg.

**Hoops and Bands.**—Users of hoops and bands are confining purchases to small lots for prompt shipment and are showing little interest in future requirements. All mills are hungry for business and reports are heard of slight concessions on desirable business. We quote the market as follows:

Hoops in carload lots, 1.45c, Pittsburg; in less than carload lots, 1.55c; bands, 1.40c, base, with net extras, as per standard steel.

**Merchant Bars.**—Agricultural interests are beginning to show more interest in their requirements for the year beginning July 1, and it is expected that some fairly large contracts will be awarded in the very near future. At present purchases are being confined to small lots to cover actual needs. The larger mills continue to quote 1.40c, Pittsburg, as the absolute minimum, but the larger consuming interests are not inclined to buy for forward delivery at this figure. Specifications against contracts show a slight gain. The bar iron market is weak and the small amount of business going is bringing out low prices. Manufacturers are arranging with the Amalgamated Association of Iron, Steel and Tin Workers for the annual wage scale conference to be held probably at Cambridge Springs, Pa., about June 6, and the indications are that manufacturers will not agree to pay the present scale. Specifications against contracts for shafting are somewhat heavier, but little new business is appearing. We quote the market as follows:

Common iron bars, 1.30c, Pittsburg; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator, 1.40c; channels, angles, zees, tees, under 3-inch, 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

**Muck Bar.**—There is no fresh inquiry and no important sales have been made for some time. Some mills are holding out for $30, Pittsburg, but this price no doubt could be shaded. We quote the best grades of muck bar nominally at from $29 to $30, Pittsburg.

**Structural.**—No large awards for structural steel have been placed in this market, although there is fairly heavy tonnage under actual negotiation. Plans for the proposed new Oliver hotel building, which will re-

quire from 10,000 to 15,000 tons of steel; the proposed new Point bridge, which will take about 9,000 tons; the Pennsylvania Hotel Co. building, about 4,000 tons; the proposed new theater building to be erected in Diamond street, Pittsburg, which will require about 3,000 tons of steel, and the proposed new buildings to be erected at Midland, Pa., by the Pittsburg Crucible Steel Co., which will require 6,000 tons, have advanced to the stage where bids for the steel will likely be asked in the very near future. Structural steel mills are operating at about the same rate as last month. We quote the market as follows:

**Beams and channels, 15 inches and under, 1.40c; over 15 inches, 1.50c; zees, 1.40c; tees, 1.45c; angles, from 3 to 6 inches, 1.40c; over 6 inches, 1.50c; universal and sheared plates, 6¼ inches wide and wider, 1.40c.**

**Merchant Pipe.**—There is more inquiry and a larger volume of business in line pipe is being placed, and this market, as a whole, shows more activity, although mill operations have not been materially increased. The western interest which purchased 12 miles of 10 and 12-inch steel line pipe for delivery at Ashland, O., last week, has also closed for 15 miles of 8-inch steel line pipe. The Hope Engineering & Supply Co., Pittsburg, has been awarded a contract to build a complete natural gas plant for the Henry Gas Co., at Bartlesville, Okla., and has awarded a contract to the Mark Mfg. Co., Chicago and Zanesville, O., for 25 miles of from 2 to 8-inch steel pipe. There is an inquiry in the market for 30 miles of 12-inch steel pipe for West Virginia shipment. In addition, several other interests are figuring on heavy tonnage of steel pipe for proposed new lines. There is a fair run of small orders for merchant steel pipe and prices are firmly held. The merchant iron pipe market is not very active. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ inch to 6 inches:

**Iron and Steel Pipe Basing Prices.**

| | Steel. | | Iron. | |
|---|---|---|---|---|
| | | Butt weld. | | |
| | Black. | Galv. | Black. | Galv. |
| ⅛, ¼, ⅜ inch..... | 72 | 58 | 68 | 54 |
| ½ inch ..... | 75 | 63 | 71 | 59 |
| ¾ to 1½ inch..... | 79 | 69 | 75 | 65 |
| 2 to 3 inches ..... | 80 | 70 | 76 | 66 |
| | | Lap weld. | | |
| 2 inches ..... | 76 | 66 | 72 | 62 |
| 2½ to 4 inches ..... | 78 | 68 | 74 | 64 |
| 4½ to 6 inches..... | 77 | 67 | 73 | 63 |
| 7 to 12 inches..... | 75 | 59 | 71 | 55 |

EXTRA STRONG, PLAIN ENDS.

| | | | |
|---|---|---|---|
| | | Butt weld. | |
| ⅛, ¼, ⅜ inch ..... | 69 | 59 | 65 | 55 |
| ½ inch ..... | 74 | 68 | 70 | 64 |
| ¾ to 1½ inch..... | 78 | 72 | 74 | 68 |
| 2 to 3 inches..... | 79 | 73 | 75 | 69 |
| | | Lap weld. | | |
| 2 inches ..... | 75 | 69 | 71 | 65 |
| 2½ to 4 inches..... | 77 | 71 | 73 | 67 |
| 4½ to 6 inches..... | 76 | 70 | 72 | 66 |
| 7 to 8 inches..... | 69 | 59 | 65 | 55 |
| 9 to 12 inches..... | 64 | 54 | 60 | 50 |

DOUBLE EXTRA STRONG, PLAIN ENDS.

| | | | |
|---|---|---|---|
| | | Butt weld. | |
| ½ inch ..... | 64 | 58 | 60 | 54 |
| ¾ to 1½ inch..... | 67 | 61 | 63 | 57 |
| 2 to 3 inches..... | 69 | 63 | 65 | 59 |
| | | Lap weld. | | |
| 2 inches ..... | 65 | 59 | 61 | 55 |
| 2½ to 4 inches..... | 67 | 61 | 63 | 57 |
| 4½ to 6 inches..... | 66 | 60 | 62 | 56 |
| 7 to 8 inches ..... | 59 | 49 | 55 | 45 |

**Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.**

**Boiler Tubes.**—Several of the larger consuming interests are negotiating for their full requirements of boiler tubes over the second half of the year and in a few instances contracts have been made for this period. Most of the contracts made at the beginning of the year expire June 30, although the full tonnage involved in these orders has not been taken out. There is still considerable irregularity in prices on iron boiler tubes. We quote the following discounts on steel boiler tubes in carload lots to jobbers:

| | |
|---|---|
| 1¾ to 2¼ inch ..... | 65 |
| 2½ inch ..... | 67½ |
| 2¾ to 3¼ inch ..... | 70 |
| 3½ to 4½ inch ..... | 72½ |
| 5 and 6 inch ..... | 65 |
| 7 to 13 inch ..... | 62½ |

**To destination east of the Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg. Usual extras to jobbers and boiler manufacturers.**

**Wire Products.**—Jobbers have been advised that all contracts for wire nails, made some time ago at $1.75, Pittsburg, and under, will be terminated June 1 and that all quotations will be made on a basis of $1.80, Pittsburg. Prices on plain wire are firmly held. While the wire market as a whole is not as active as a month or so ago, some manufacturers report that consumers are specifying more liberally at present, although there is not a great deal of new business appearing. Some of the western manufacturers of cut nails continue to ask $1.65, Pittsburg, although the bulk of the trading has been done on a basis of $1.60, Pittsburg. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.70 to $1.80; retailers' carload lots, $1.85; cut nails (western makers), jobbers' carload lots, $1.60 to $1.65; cut nails (eastern makers), Pittsburg base, $1.70; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.90, with 30c for galvanizing; plain wire to jobbers in carloads, $1.60, and to dealers, in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.10.

**Wire Rods.**—Users of wire rods are specifying for moderately heavy tonnage against contracts, but trading in the open market has been light. Odd lots have been sold at $29, Pittsburg. Reports that this price has been shaded have not been confirmed. We quote $29, Pittsburg, on Bessemer and open-hearth wire rods.

**Coke.**—With one or two exceptions, furnace interests are covered for their coke requirements up to July 1, and, while little attention has been given to contracts beyond that period, it is believed that negotiations will be opened in the very near future for moderately heavy tonnage for third quarter and last half shipment. Consumers of foundry coke are closing for their forward requirements and some large orders have been booked by leading producers. The coke market, as a whole, is showing very little life and prices are not very firm. Production is being regulated to actual consumption, additional ovens having been placed on the idle list during the week. Most sellers of furnace coke are holding out for $1.50, ovens, but coke has been offered at a lower figure without any sales resulting. Prompt foundry coke has been sold as low as $1.85, ovens, although most sellers are asking from $2 to $2.15, ovens. Shipments last week aggregated approximately 290,000 tons, while the estimated production was about 278,000 tons, indicating that about 12,000 tons of stock in yards or in cars unconsigned were sent out. We quote, standard Connellsville furnace coke for prompt shipment at from $1.40 to $1.50, ovens, and $1.80, ovens, for second half delivery. On high grade Connellsville foundry coke, we quote from $1.85 to $2, ovens, for prompt shipment and from $2.15 to $2.40, ovens, for forward delivery. The Connellsville *Courier's* figures for the week ending May 13 show 24,612 active ovens with an output of 278,037 tons, as compared with 25,180 active ovens and a production of 280,367 tons the previous week.

**Old Material.**—Aggregate sales of heavy melting steel during the week involve from 15,000 to 17,000 tons at $13, delivered, an advance of 50 cents a ton, as compared with sales made last month. Of this tonnage, approximately 10,000 tons goes to a consumer along the Monongahela river. The remainder is divided among steel companies along the Ohio river and in the Pittsburg territory. Dealers are not able to pick up very much tonnage at $12.75, and as a result, some dealers will not quote $13, delivered. We also note two sales of 500 tons of bundled sheet scrap, each at from $10.50 to $10.75, delivered, and scattered lots of machine shop turnings and No. 1 wrought scrap. Cast borings cannot be had at $8.50, delivered, and we quote the market at from $8.75 to $9, delivered. Demand for No. 1 cast scrap is not very heavy and sales have been made as low as $13. With

the exception of a steel company east of Pittsburg, practically all consumers in this territory, who held up shipments in April, are now taking carload lots. We quote, gross tons, delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee as follows:

| | |
|---|---|
| Heavy melting scrap | $13.00 to 13.25 |
| Rerolling rails | 14.00 to 14.25 |
| Bundled sheet scrap | 10.50 to 10.75 |
| Iron axles | 23.50 to 24.00 |
| Old iron rails | 15.50 to 16.00 |
| No. 1 wrought scrap | 13.50 to 14.00 |
| Old car wheels | 13.00 to 13.50 |
| Low phosphorus | 16.50 to 17.00 |
| Machine shop turnings | 9.00 to 9.25 |
| Cast borings | 8.75 to 9.00 |
| No. 1 cast scrap | 13.00 to 13.50 |
| Malleable | 13.00 to 13.50 |
| Stove plate | 10.50 to 10.75 |

## CHICAGO

### Increased Inquiry for Pig Iron.—Orders Come Very Slowly.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, May 23.

The decision of the supreme court in the Standard Oil case had a very favorable sentimental effect, but, up to the present time, little new business has been placed with steel makers in the west and as far as finished materials are concerned, the past week was, if anything, a little quieter than the several preceding weeks. Rail orders taken by the leading interest amounted to only 3,000 tons in scattering lots. Deep cuts in the price of open hearth forging billets are being made by independent mills. The market is absolutely bare of car inquiries and local plate mills are operating at about 60 per cent capacity. New structural lettings reported let in the Chicago market last week amount to only 1,063 tons. Pig iron is weak and sales are scarce, although inquiry is considerably better. Further declines are noted in the Chicago scrap market.

**Pig Iron.**—The volume of inquiries in the local market is heavier than it has been for some weeks, but otherwise the situation shows little change. A foundry in the Chicago territory is inquiring for 500 tons of northern foundry iron; another firm is asking for prices on 500 tons of southern foundry iron and inquiries are also noted for 1,000 tons of malleable and 1,000 tons of southern No. 2, which together with other scattering inquiries makes a total of over 5,000 tons reported to be under negotiation in this market at present. Practically all of this iron is for delivery throughout the second half. The actual amount of business closed last week was very light. Allis-Chalmers bought 100 tons of 8 per cent silicon iron, at a price said to be $16.25, f. o. b. Southern Ohio furnace. The price of southern iron is very soft and it is comparatively easy to get quotations as low as $10.75, Birmingham, on No. 2 foundry. We note an inquiry for low phosphorus northern iron, running about 2.50 per cent silicon, on which a southern Ohio furnace has quoted $16.15, delivered, in Chicago territory.

The following prices represent the market for Chicago delivery, except northern iron, which is quoted f. o. b. furnace:

(Shipment this year.)

| | |
|---|---|
| Lake Superior charcoal | $17.00 |
| Northern foundry No. 2 | 15.00 |
| Southern foundry No. 2 | 15.10 |
| Southern silveries, 5 per cent silicon | 16.35 |
| Jackson Co. silveries, 8 per cent | 18.65 |
| Malleable Bessemer | 15.00 |
| Alabama basic | 15.10 |

**Billets.**—There is very little billet business under negotiation and the few sales that are being made are going at low prices. While the Corporation is maintaining its price firmly at $30.60 per ton for open hearth forging billets, independent mills are cutting this all the way from $4.00 to $6.00. We quote, open-hearth forging billets, $27.00 f. o. b. Chicago; open hearth re-rolling billets, $25.60, base, Chicago.

**Merchant Bars.**—Bar iron specifications are fair and some makers report an increase in orders from railroads during May amounting to about 15 per cent, compared with April. Prices are a little weaker and now run from 1.20 to 1.25c, Chicago. Hard steel is weak and has been shaded $1 a ton recently, making current quotations 1.25c, Chicago. New business in soft steel bars is coming in very slowly, although there is no talk in the west of a reduction in prices. A fair business in concrete reinforcing bars is reported. Business in shafting remains light with prices fairly well maintained.

We quote, Chicago delivery, as follows:

Bar iron, 1.20c to 1.25c; hard steel bars, rerolled, 1.25c to 1.30c; soft steel bars and **bands and small shapes, 1.58c to 1.63c, base; hoops, 1.68c to 1.73c; planished or smooth finished tire steel, 1.78c to 1.83c, base; iron finished tire steel, 1.73c, base; smooth finished** machinery steel, one inch and larger, 1.98c; **spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 57 per cent off the list for carload lots, and 52 per cent off for less than carload lots, carload freight allowed to points in base territory.**

On iron and steel from local stock, we quote, as follows:

**Bar iron, 1.80c to 1.90c per pound base; soft steel bars, 1.80c to 1.90c per pound base; soft steel hoops, 2.10c to 2.20c, full extras.**

**Structural Material.** — Fabricating contracts reported let in this market last week total 1,063 tons. The American Bridge Co. has taken 115 tons for one 216-foot and two 75-foot steel spans over the Spokane river, near Spokane, Wash. An addition to the Post office, Salt Lake City, Utah, which will require 225 tons, will be fabricated by the Minneapolis Steel & Machinery Co. Contracts have been let covering the Saticoy bridge, Ventura county, Cal., 300 tons, and the Harshaw, Fuller & Goodwin Co. warehouse at Elyria, Ohio, 116 tons. The Nelson Co. has taken a contract for the Mother House and Academy, Sisters of Notre Dame, Mankato, Minn., 307 tons. As reported last week, the Chicago & Northwestern Railway let 8,150 tons of bridge material and this was divided as follows: To the American Bridge Co., 7,400 tons and to the Cambria Steel Co., 650 tons. The Mallers building at Madison street and Wabash avenue, Chicago, which will require about 4,000 tons of standard shapes, will be let soon. Plans are being prepared by Holabird & Roche for the new Rand-McNally building, Chicago, which will require 3,000 tons of structural material.

We quote, structural material, f. o. b. Chicago, as follows:

**Beams and channels, 15 inches and under, 1.58c to 1.63c. For extras, see Pittsburg report.**

Plain material out of store is as follows:

**All angles, 3 inches and larger, including 6 inches, $1.80 to $1.90 per 100 pounds; angles over 6 inches, $1.90 to $2 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.80 per 100 pounds, base; channels, 3 inches and larger, $1.80 per 100 pounds, base.**

**Rails and Track Supplies.** — New business in rails is very light and the Illinois Steel Co. booked only about 3,000 tons last week. Specifications, however, were better than for some time previous. Business in light rails is fair and shows no diminution. A number of large western trunk lines have not yet placed heavy orders for the ensuing year, and it is expected that some comfortable tonnages will be booked following the end of the fiscal year, June 30.

For prices on standard sections, see Pittsburg report.

We quote, light rails, f. o. b. Chicago, and track supplies, f. o. b. Joliet, as follows:

**Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.**

**Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.**

**Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.65c to 1.75c; smaller size spikes, 1.70c, base; track bolts with square nuts, 2.15c to 2.25c, base.**

**Plates.** — A very dull market for plates exists in the west and local mills are operating at about 60 per cent capacity, on a strictly hand-to-mouth basis. Scarcely enough orders are kept on hand to run the mill 10 days. There is still some shading on plates up to 80 inches wide, and it is not difficult to obtain quotations as low as 1.53c, Chicago.

We quote, mill prices, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.58c to 1.63c. For extras, see Pittsburg report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.80c to 1.90c; from 72 inches to 96 inches wide, 1.90c to 2c; 3-16 inch up to and including 60 inches wide, 1.90c to 2c; 72 inches, 2.15c to 2.25c; No. 8, up to 60 inches wide, 1.95c to 2.05c. Flange quality and heads, 25c extra.

**Sheets.**—Further irregularity in price is noted and there has been some disposition on the part of jobbers to cut quotations. A fair amount of new business is being booked by the local mill from day to day, but only enough to keep it operating at from 65 to 70 per cent capacity.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 2.10c to 2.20c; No. 12, 2.15c to 2.25c. Box annealed, No. 28, 2.75c to 2.85c. Galvanized, No. 28, 3.65c to 3.75c.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents.

**Wire Products.**—Orders for wire are only moderate and nails are moving somewhat slowly. There are no reports of shading on nails or wire in this market, although it is understood that eastern mills are trimming prices a little. Barb wire shipments are catching up and deliveries are very satisfactory from a consumers' standpoint.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.98; retailers' carload lots, $2.03; retailers' less than carload lots, $2.13; painted barb wire, jobbers' carload lots, $1.98; retailers' carload lots, $2.03; retailers', less than carload lots, $2.13; with 30c for galvanizing; plain wire to jobbers, $1.78; plain wire, retailers' carload lots, $1.83; staples, bright, $1.98.

**Merchant Pipe and Tubes.**—There has been very little change in the local tube market during the past week. Reduced prices on tubes out of store have now been in effect for about a month, but have had no appreciable influence on the volume of business. Merchant pipe orders are seasonably heavy and tube business is comparatively light. Boiler shops are doing little and are ordering from stock rather than from mills and for this reason store business in tubes is fairly good.

We quote, iron and steel pipe and tubes, out of store, as follows:

**Iron and Steel Pipe Basing Prices.**

| | Steel. | | Iron. | |
|---|---|---|---|---|
| | Black. | Galv. | Black. | Galv. |
| ⅛-⅜ inch | 69.2 | 54.2 | 63.2 | 48.2 |
| ½ inch | 72.2 | 59.2 | 66.2 | 53.2 |
| ¾ in. to 3 in. | 77.2 | 66.2 | 72.2 | 61.2 |
| 4½-6 inches | 74.2 | 63.2 | 69.2 | 58.2 |
| 7-12 inches | 71.2 | 54.2 | 67.2 | 50.2 |
| EXTRA STRONG PLAIN ENDS. | | | | |
| ½ inch | 70.2 | 63.2 | 54.2 | 52.2 |
| 2-3 inches | 75.2 | 68.2 | 61.2 | 55.2 |
| 7-8 inches | 65.2 | .... | 59.2 | 47.2 |
| DOUBLE EXTRA STRONG. | | | | |
| ½ inch | 58.2 | 50.2 | .... | .... |
| 2-3 inches | 63.2 | 55.2 | .... | .... |
| 7-8 inches | 53.2 | 41.2 | .... | .... |

**Tubes.**

| | Lap weld steel. Per cent. | Charcoal iron. Per cent. | Shelby seamless. Per cent. |
|---|---|---|---|
| 1 inch | 39 | .. | 57½ |
| 1¼ to 2¼ inch | 55 | 40 | 35 |
| 2¾ to 3¼ inch | 62½ | 50 | 46 |

**Cast Iron Pipe.**—No important contracts were let in the west last week. The United States Cast Iron Pipe & Foundry Co. is the low bidder on 3,000 tons of water pipe at St. Louis, for which contracts will be signed this week. Bids were opened at La Crosse, Wis., on May 23, on 1,200 tons of water pipe. Prices are being fairly well maintained, in spite of the falling pig iron market, although several small makers are willing to shade current quotations.

We quote the market, f. o. b. Chicago, as follows:

Four-inch water pipe, $25; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

**Old Material.**—The Chicago scrap market is weak and further declines are noted in several instances. Old iron rails are now quoted $14 per gross ton, Chicago, and re-rolled rails, $12.25. Iron car axles have been cut to $18 per net ton and steel car axles to about $16.50. No. 1 busheling is now quoted $8.75, Chicago. The Chicago, Milwaukee & St. Paul sold 1,400 tons of various grades of old material on Monday.

We quote the market, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.

| | |
|---|---|
| Old car wheels | $12.75 to 13.25 |
| Old iron rails | 14.50 to 15.00 |
| Rerolling rails (5 ft. and over) | 12.25 to 12.75 |
| Old steel rails (3 ft. and under) | 11.25 to 11.75 |
| Frogs, switches and guards | 10.50 to 11.00 |
| Heavy melting steel | 10.25 to 10.75 |
| Shoveling steel | 10.00 to 10.50 |

NET TONS.

| | |
|---|---|
| No. 1 R. R. wrought | $11.00 to 11.50 |
| No. 2 R. R. wrought | 10.00 to 10.50 |
| Arch bars and transoms | 13.50 to 14.00 |
| Knuckles, couplers and springs | 10.00 to 10.50 |
| Shafting | 15.00 to 15.50 |
| Iron car axles | 18.00 to 18.50 |
| Steel car axles | 16.50 to 17.00 |
| Locomotive tires | 17.00 to 18.00 |
| Dealers' forge | 10.50 to 11.00 |
| Pipes and flues | 8.00 to 8.50 |
| No. 1 cast | 10.75 to 11.25 |
| No. 1 busheling | 8.75 to 9.25 |
| No. 2 busheling | 6.75 to 7.25 |
| No. 1 boiler cut | 7.50 to 8.00 |
| Boiler punchings | 12.50 to 13.00 |
| Cast and mixed borings | 5.25 to 5.75 |
| Machine shop turnings | 6.25 to 6.75 |
| Railroad malleable | 10.25 to 10.75 |
| Agricultural malleable | 9.25 to 9.75 |
| Stove plate and light cast scrap | 9.25 to 9.75 |
| Angle bars, splices, etc., iron | 12.50 to 13.00 |
| Angle bars, steel | 10.50 to 11.00 |

## Large Tonnage of Ore Sold.—Inquiry for Bar Iron.

Office of THE IRON TRADE REVIEW,
Penton Building, May 23.

**Iron Ore.**—The most important sales made since those of W. P. Snyder & Co., April 20, have just been closed. A Cleveland firm has sold 300,000 tons of old range non-Bessemer for delivery during the three years beginning this year, 100,000 tons each year at a Lake Michigan port, and 100,000 tons for delivery at Lake Erie this year. It is understood that sales were made at slightly below regular quotations, and that the firm making the deals has now sold practically all of its standard ores for this year's delivery. Ore dealers selling at regular prices are taking very little business, and say that they do not expect to do much until the limited tonnage offered at concessions is disposed of. During the past week, representatives of lake ore agencies have continued negotiations with the Bethlehem Steel Co., but no contracts have been made, and the company is finding considerable difficulty in contracting for ores sufficiently low in phosphorus at prices which are obtainable. The price offered by the steel company—8 cents per unit delivered,—will not be considered by lake ore companies.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

**Pig Iron.**—The inquiry of the Canadian Car & Foundry Co. for 2,500 tons of basic for delivery at the rate of 500 tons per month beginning in May was figured on by at least one Cleveland company, but the contract was not placed in this city. We note the sale of 200 tons of southern No. 1 for last half at $11 Birmingham. The quotation of $10.50 Birmingham for No. 2 is general, and the market seems to be tending downward. While the pig iron market is extremely dull, sellers express the conviction that numerous buyers will not be able to delay making contracts much longer. We quote, delivered in Cleveland, for prompt shipment and the higher for second half:

| | |
|---|---|
| No. 1 foundry | $14.50 |
| No. 2 foundry | 14.25 |

| | |
|---|---|
| No. 2 southern | 14.85 to 15.35 |
| Gray forge | 13.25 |
| Bessemer | 15.90 |
| Lake Superior charcoal | 17.50 |
| Jackson Co. 8 per cent silvery | 18.50 |

**Coke.**—The market continues quiet with no change in prices. We quote:

Connellsville furnace coke, $1.40 to $1.50 for prompt delivery, and $1.80 for second half. Connellsville foundry coke, $1.95 to $2 for prompt, and $2 to $2.40 for second half.

**Finished Material.**—Interest has centered in bidding on the new Y. M. C. A. building, which will require 1,350 tons. On the former, the lowest bidder on plans as revised by the company was the American Bridge Co. at $66,300, while on the bids based on the plans as drawn by the architects, Hubbell & Benes, T. H. Brooks & Co. were the lowest bidders at $69,000. On the Statler hotel, the contract has been awarded to the American Bridge Co. Structural business shows some improvement, especially in specifications. The Merchants' Dispatch Transportation Co., Rochester, N. Y., is in the market for 1,150 tons of bar iron and other material, the largest inquiry of this kind that has appeared in many a day. Recent sales of steel wire at 1.70 Pittsburg are attributed to jobbers who have had low priced contracts. The market is now firmer.

**Old Material.**—Some inquiry has developed leading to sales in this city of relaying rails. Other lines show few signs of life. A firm offer of $11.75 for heavy steel for delivery outside this city has been made in two instances, each for tonnages ranging from 300 to 500 tons. However, outside consumers are apparently not any more inclined to buy than Cleveland users. We quote, gross tons, f. o. b. Cleveland, as follows:

| | |
|---|---|
| Old iron rails | $15.00 to 15.50 |
| Old steel rails (under 6 ft.) | 13.50 to 14.00 |
| Old steel rails (over 6 ft.) | 12.00 to 12.50 |
| Relaying rails | 20.50 to 21.00 |
| Old car wheels | 12.50 to 13.00 |
| Old steel boiler plate | 10.00 to 10.50 |
| Malleable iron (railroad) | 12.25 to 12.75 |
| Steel axles | 19.00 to 19.50 |
| Axle turnings | 8.00 to 8.50 |
| Malleable iron (agricultural) | 11.00 to 11.50 |
| Heavy steel | 11.50 to 12.00 |
| Country mixed steel | 9.50 to 10.00 |

We quote, net tons, as follows:

| | |
|---|---|
| No. 1 R. R. wrought | $12.50 to 13.00 |
| No. 1 busheling | 11.00 to 11.50 |
| No. 1 machine cast | 11.50 to 12.00 |
| No. 1 dealers' wrought | 11.00 to 11.50 |
| Machine shop turnings | 6.50 to 7.00 |
| Cast borings | 6.00 to 6.50 |
| Pipes and flues | 8.00 to 8.50 |
| Wrought drillings | 6.50 to 7.00 |
| Stove plate | 10.50 to 11.00 |

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The Culver Wrought Iron Range Co. of St. Louis has obtained an option on 10 acres of ground at the southeast corner of Page avenue and the Wabash tracks in that city as a site for a $500,000 plant the company proposes to erect.

### Virginia Pig Iron Selling at Lower Quotations.

Office of THE IRON TRADE REVIEW,
808 Provident Bank Bldg., May 23.

**Pig Iron.**—Except for a somewhat better inquiry and some signs of renewed activity, there is no change in the pig iron market, locally. An inquiry is out for from 300 to 500 tons of northern and southern iron for a northern Indiana melter. An inquiry is out for 200 tons of high phosphorus iron and one melter is open for some special high sulphur iron amounting to 400 or 500 tons, both for close-by delivery. Several small tonnages of foundry iron have been closed in northern and central Indiana, and one or two in central Ohio, aggregating about 1,000 tons. The Louisville & Nashville railroad bought 300 tons of southern foundry for its southern shops. In the east a number of 600 and 700-ton lots of Virginia No. 2X iron have been sold at about $12.25. Although there is little increase in actual sales of pig iron, more buyers are inquiring for small lots, and buyers and sellers are closer together on prices than for some time past. Apparently the stocks on hand on furnace yards are centered around No. 2 iron, as the lower grades of No. 4 and gray forge are scarce and prices are generally maintained on these grades. Malleable and basic continue inactive and can be bought for about $14. Jackson county silicon is down to $17.20. For the last half, prices for contract remain at $11, Birmingham, for southern No. 2, and $14 for northern No. 2. Based on a freight rate of $3.25 from Birmingham, and $1.20 from Ironton, we quote, Cincinnati and southern Ohio, as follows:

| | |
|---|---|
| Southern foundry No. 2 | $13.75 to 14.25 |
| Southern foundry No. 3 | 13.25 to 13.50 |
| Southrn foundery No. 4 | 13.25 |
| Southern gray forge | 12.75 |
| Mottled | 12.75 |
| Southern No. 1 soft | 14.50 to 14.75 |
| Southern No. 2 soft | 14.00 to 14.25 |
| Standard southern car wheel | 25.50 to 25.75 |
| Northern No. 2 foundry | 14.95 to 15.20 |
| Northern No. 3 foundry | 14.45 to 14.70 |
| Northern No. 4 foundry | 14.20 |
| Jackson county 8 per cent silicon. | 17.20 |

**Coke.** — Connellsville furnace coke continues to sag a little and good brands can be bought as low as $1.35, for prompt shipment, and as low as $1.65 for contract for the remainder of the year. The better grades of coke are held 10 cents higher than this both for prompt and future shipments, with the other brands of furnace coke at $1.60 to $1.75 for prompt and as high as $1.85 for future shipments. Good foundry coke can be had as low as $1.80 for prompt shipment, and with very little premium for contracts. Foundry contracts continue holding up well and a number are being closed at the above figures. Among the sales of the past week are several lots of 8,000 tons of Connellsville coke going to British Columbia, Canada, for smelter purposes. We quote the producing districts as follows:

| | Prompt shipment. | Contract second half. |
|---|---|---|
| **Connellsville district:** | | |
| Foundry coke | $2.00 to 2.25 | $2.25 to 2.40 |
| Furnace coke | 1.35 to 1.60 | 1.75 to 1.85 |
| **Wise county district:** | | |
| Foundry coke | 2.00 to 2.25 | 2.10 to 2.35 |
| Furnace coke | 1.75 to 2.00 | *Sliding [scale basis. |
| **Pocahontas district:** | | |
| Foundry coke | 2.00 to 2.15 | 2.10 to 2.35 |
| Furnace coke | 1.60 to 1.75 | 1.75 to 1.85 |
| **New river:** | | |
| Foundry coke | 2.50 to 3.25 | 2.60 to 3.25 |
| Furnace coke | 2.10 to 2.15 | 2.10 to 2.20 |

*Sliding scale basis means $1.60 for coke based on $9, Birmingham for pig iron, with an advance of 16 2-3 per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

**Finished Material.**—It is expected that next month will begin activity for many lines of finished material, as the agricultural implement makers will, it is hoped, be in the market. While local warehouses report fair selling, the volume is not considered good, and no indications are in sight to make it very much better. While some shading has been currently reported on plates and bars, the Pittsburg mill base of $1.40 is pretty generally adhered to. The Ralston Steel Car Co., of East Columbus, which is in the market for some machine tools for an extension recently completed to its structural shop, states that the reported erection of its new shops is premature, but that it will begin work on buildings in the fall.

**Old Material.**—The railroads have found the old material market so low that several of them have not sold their monthly accumulations, and are holding them over for better prices. Mills are taking the choice of the market at very low figures, and, while there have been no material reductions lately, it is because there is not enough activity to establish a market. We quote the old material market for delivery in consumers' yards, Cincinnati, and southern Ohio, as follows:

GROSS TONS.

| | |
|---|---|
| Old iron rails, gross | $14.00 to 14.50 |
| Old steel, rerolling, gross | 13.00 to 14.00 |
| Old iron axles, gross | 19.25 to 19.75 |
| Steel melting scrap, gross | 11.00 to 11.75 |
| Car wheels, gross | 11.50 to 12.50 |

NET TONS.

| | |
|---|---|
| Old No. 1 R. R. wrought | $12.25 to 12.75 |
| No. 1 machinery | 11.00 to 12.00 |
| No. 1 busheling | 9.00 to 9.50 |
| Stove plate | 8.25 to 9.00 |
| Machine shop turnings | 6.50 to 7.00 |
| Cast borings | 5.50 to 6.25 |
| Grate bars | 7.75 to 8.50 |
| Sheet scrap, bundled | 7.50 to 8.50 |
| No. 1 cast scrap | 10.50 to 11.00 |
| Heavy turnings | 7.75 to 8.75 |

## PHILADELPHIA

**Leading Virginia Maker Cuts Market Sharply—Panama Canal Requirements.**

May 22.

**Pig Iron.**—Of leading importance in the week has been the action of the largest producer of Virginia iron in cutting the market 75 cents a ton for third quarter and 50 cents for fourth quarter, or to $12.25 and $12.50 furnace for 2X, respectively, for these periods of shipment. This maker, which for about four years has carried upon its books a large stock of iron, exceeding 150,000, has set out to sell about 25,000 tons with the presumed purpose of stimulating a buying movement and has already disposed of probably 15,000 tons, of which 2,000 to 3,000 tons came to this territory at from $15.05 to $15.30, delivered, thereby underselling the Lehigh and Schuylkill Valley grades, which are held at a $15.50, delivered, minimum for No. 2X. Considerable of the iron sold has also gone to local Virginia buyers, and has been scattered broadly throughout the east and New England as the concessions are being offered generally through merchants and middlemen. All sales are being made subject to confirmation and in the view that the new price will prevail for a limited period only, other Virginia makers are holding off from meeting the price and are still quoting $13 furnace. Reports of sales of basic to eastern steel works, at $14.50, delivered, in addition to those at this price, previously announced, are current, but confirmation is lacking, as both buyers and sellers are secretive as to details. The basic market in the east, however, has been established at $14.50, delivered, and offers of the principal consumers are at this figure. Some negotiations are understood to be still pending. A lot of 800 tons of Virginia basic offered in this territory has been absorbed by Virginia pipe makers. A pipe maker in this district has also closed for 1,000 to 2,000 tons of Virginia lower grades at $12, furnace, or $14.80, delivered. In low phosphorus iron, one of the principal consumers in this district is negotiating for 5,000 tons for last half. Small sales of the standard product at $21, Philadelphia, are noted, but other material less desirable in some element is available at $20.50, delivered. On the whole, buyers are still indifferent to pig iron propositions unless attractive prices are named, and it is necessary for sellers to seek out the business. Open buying and inquiry is in small lots. One of the Heckscher furnaces, which is on basic, is about to go out for relining.

The United States Steel Products Co. is low bidder on 1,550 tons of pig iron for annual Panama canal requirements at $16.02, delivered, for 400 tons of No. 1, $15.68, delivered, for 250 tons of No. 2, and $15.45, delivered, for 900 tons of No. 3.

| | |
|---|---|
| No. 1X foundry | $15.75 to 16.25 |
| No. 2X foundry | 15.50 to 15.75 |
| No. 2 plain | 15.00 to 15.50 |
| Standard gray forge | 14.75 to 15.00 |
| Basic | 14.50 to 15.00 |
| No. 2X Virginia | 15.05 to 15.30 |
| No. 2 southern | 14.75 to 15.00 |
| Standard low phosphorus | 21.00 |

**Sheets.**—Some of the plate mills have been more active in seeking orders for No. 10 gage at 1.55c, Pittsburg, or full plate prices with a 15-cent differential added, and sheet makers are meeting this competition with equal quotations on No. 10 gage of the annealed product. On the ordinary sheet trade, the 1.65c price for No. 10 gage blue annealed sheets is being quoted. Sheet mills in the east are slightly less active than they have been but the volume of business, made up largely of smaller orders, shows litle change. No. 10 gage blue annealed sheets are quotable at from 1.70c to 1.80c Philadelphia.

**Finished Material.**—In some cases, appreciable improvement in the volume of business entered by makers has been apparent, but in general, any change for the better in the situation has been largely in terms of sentiment, which has become more cheerful. Some of the eastern plate makers report that, for the first time in a number of weeks, the volume of orders received the past week has exceeded the rated capacity of the works for such a period. A number of the eastern makers of finished lines, however, continue to ship at a slightly greater rate than they are taking new business, and operations have been further reduced in some cases. The bar market is still dull, with price irregularities on bar iron and re-rolled steel bars. Some of the eastern bar iron mills, it is reported, will go to 1.20c, mill, but the lowest price on re-rolled steel bars encountered in the east has been 1.25c, Pittsburg. Wire makers at a recent meeting in New York reaffirmed present prices for the next 60 days.

A great many small structural projects are appearing and the number of larger tonnage contracts active are encouraging. Plain material prices are firm, but fabricating quotations remain very close. Detrick Bros., Baltimore, have the 1,100 tons for the Maryland Casualty Co., that city, which will include a considerable quantity of Bethlehem sections. The Baltimore Bridge Co. has 700 tons for the Army and Navy club, Washington. The Riggs hotel and theater, Washington, 2,000 tons, and the Commercial National Bank building, Charlotte, N. C., placed by latest estimate at 800 tons, have been postponed for bids until this week. Bids have gone in for 350 tons for a power house for the Scranton Electric Co., Scranton, Pa. Several small bridges for the Chesapeake & Ohio are up.

The United States Steel Exports Co. is low bidder upon most of the material in the annual budget of requirements of iron and steel products for the Panama canal, aggregating a total of about 10,000 tons, including 3,000 tons of rails, 1,000 tons of shapes and plates, 600 tons of steel bars, 3,750 kegs of railroad spikes and miscellaneous material. The Bethlehem Steel Co. is low on 1,800 tons of open-hearth rails, and the Jones & Laughlin Steel Co. by a slight margin on the spikes, but the United States Steel Products Co., which is second on the latter, offers more desirable delivery conditions.

In shipbuilding work, the American-Hawaiian Steamship Co. is figuring upon the construction of four vessels, to be ready for navigation through the Panama canal. Each will require about 3,000 tons of shapes and plates.

**Structural shapes, 1.55c to 1.60c; steel plates 1.55c to 1.60c; steel bars, 1.55c to 1.60c; refined** bar iron, 1.27c to 1.32c; cut nails, $1.75 to $1.80; blue annealed sheets, No. 10 gage, 1.70c to 1.80c; 4 x 4-inch open-hearth rolling billets, $25.40; forging billets, $30.40.

**Old Material.**—The market continues one of small trading and the range of negotiations is very narrow. The steel mills are getting but odd lots of heavy melting stock at their offers of $13, delivered, as not a great amount of material is being brought out at this figure, but these buyers appear in no way disposed to change conditions or to stimulate tonnage offering by higher prices. Brokers are covering on their contracts at about $13.25, delivered. Prices, though not strong in tone, are practically stationary with the exception of wrought pipe, which is off 25 cents this week from previous levels. We quote, gross tons, delivered to eastern Pennsylvania and New Jersey consumers, as follows:

| | |
|---|---|
| Old iron rails | $16.50 to 17.00 |
| Old steel rails (re-rolling) | 13.75 to 14.00 |
| Heavy melting steel | 13.00 to 13.50 |
| Old car wheels | 13.00 to 13.50 |
| Old steel car axles | 18.00 to 19.00 |
| Old iron car axles | 25.00 to 26.00 |
| No. 1 R. R. wrought | 15.00 to 15.50 |
| Wrought pipe | 12.50 to 12.75 |
| Cast borings | 7.50 to 8.00 |
| Wrought turnings | 8.50 to 9.00 |
| Heavy cast scrap | 13.00 to 13.50 |
| Railroad malleable | 11.50 to 12.00 |
| Stove plate | 10.00 to 10.50 |

# NEW YORK

**Pig Iron Sales of Heavier Volume—Sentiment is Improved.**

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., May 23.

**Iron Ore.**—A current report that an eastern steel works has closed for a block of 150,000 tons of Swedish ore for this season's shipment, is officially denied by the reported seller. The only new sales of Swedish ore made this season have been three cargoes previously reported. It has been known in the market that this steel interest has been negotiating for a large block of ore in different directions. An example of the high ocean freights ruling on ore shipments from distant parts of the old world, the chartering of the steamer Tuddal from Poti, Russia, to Baltimore or Philadelphia, has just been done at 14s 6d for a cargo of 5,000 tons of manganese ore. This is regarded as a high rate of freight from the port in question.

**Pig Iron.**—Stimulated generally by low prices, a much heavier volume of buying has been done the past week in different eastern districts, which is roughly estimated as being from 30,000 to 40,000 tons. About 10,000 to 15,000 tons of this amount has been in Virginia foundry grades, upon which a reduction of 75 and 50 cents to $12.25 for third quarter and $12.50 on fourth quarter, respectively, for No. 2X iron, has been made by the leading maker in that district. Most of this iron sold has been for third quarter and much of it has gone to New England consumers at prices ranging from $15.05 to $15.30, on docks at water points, to $16, delivered, in the interior. Leading Connecticut consumers have been sounding the market on heavy lots of malleable iron, aggregating from 5,000 to 15,000 tons, for extended forward shipment, but have not yet placed this business. New Jersey stove works have taken 1,500 tons of No. 2X for last half and another leading consumer several thousand tons of foundry iron for different eastern plants, the business going to Buffalo furnaces, where $13.50 for No. 2X is now more freely offered. The New York Air Brake is understood to have placed with Buffalo makers a portion of its recent inquiry for 4,750 tons of different grades. Some fair-sized sales for Canadian shipment are noted. A leading buyer has taken 1,000 tons of 2X for nearby shipment for its Canadian plant, while the Canadian Car & Foundry Co. has closed with Buffalo makers on an inquiry for 2,500 tons of basic to be delivered over the next five months at Welland, Ont. This buyer has also been inquiring for 2,500 to 3,000 tons of low phosphorus iron for delivery at Montreal, after Aug. 1, and it is believed this business will go to English makers. Some fresh basic negotiations have been started by eastern Pennsylvania steel works and offers of $14.50, at which one large sale was recently made, as reported, are under consideration. We quote, for prompt and third quarter shipment, as follows:

| | |
|---|---|
| Northern foundry No. 1 | $15.75 to 16.00 |
| **No. 2X foundry** | **15.50 to 15.75** |
| **No. 2 plain** | **15.00 to 15.50** |
| No. 2 Virginia | 15.05 to 15.30 |
| No. 2 southern foundry | 15.00 to 15.25 |
| Malleable | 15.25 to 15.75 |
| **Gray forge** | **14.75 to 15.00** |

**Coke.** — Occasionally some large long-term contracts for foundry coke are being made with eastern consumers. A Connecticut buyer has bought about 240 cars of high grade foundry coke for extended shipment at $2.40, ovens.

**Ferro-Alloys.**—Interest in ferro-alloys is light at present. Probably 500 tons of ferro-manganese in scattered lots, is pending, chiefly for western shipment. We quote 80 per cent ferro-manganese at $36.50 to $37.75, Baltimore, and 50 per cent ferro-silicon at from $53 to $54, Pittsburg.

**Cast Iron Pipe.**—James J. McAvoy is the low bidder on the contractor's letting of 6,500 tons of 6 to 20-inch pipe and specials for the borough of Richmond, upon which bids were entered this week. The remaining tonnage of the large lot of pipe recently asked for by the metropolis goes in tomorrow. This includes 8,800 tons for the Bronx and 1,600 tons for Queens. Figures have gone in for 2,750 tons of 12 to 24-inch sizes for Boston, and 1,200 tons for Lynn, Mass., but awards have not yet been announced. Some improvement in inquiry in private work is reported. We quote 6-inch pipe at from $21 to $21.50, f. o. b. New York, in carload lots.

**Finished Material.**—While there has undoubtedly been a change for the better in the sentimental side of the market and, in some isolated cases, actual improvement is shown, the general situation as to buying volume manifests no marked developments. Buyers are following conservative policies in closing for their needs and the mills likewise have adjusted their affairs so that little stocks are being accumulated. The result is that any buying of prominence will be quickly reflected in an increase of plant operations.

Structural makers will consider the situation in their line at a meeting in this city tomorrow. While a very fair amount of work is coming out, much of it is hanging fire and some structural makers report the position of their books is not as good as has been. Fabricating prices continue low. The formal contract for the New York Telephone Exchange building has finally been placed with Levering & Gerrigues. The plain material has not yet been placed. If standard sections, about 5,500 tons will be used, or a less amount if Bethlehem shapes are selected. The Rosenbloom department stores, Syracuse, 900 tons, have gone to the Syracuse Bridge Co.; the extension of the plant of the Baltimore Copper Melting & Rolling Co., Baltimore, 600 tons, to the McClintic-Marshall Construction Co. and a bridge for a traction company at Ft. Edward, N. Y., 200 tons, to the American Bridge Co. The general contract for the Virginia Life Insurance Building, Richmond, Va., 1,000 tons, has been taken by the Geo. A. Fuller Co. The Chesapeake & Ohio Railroad has up a viaduct at Marion, Ind., about 800 tons and a highway bridge at McElhatton, Pa., 800 tons, is pending. Bids are going in this week on 3,900 tons for the Aeolian building, Forty-second street, this city, and on 1,000 tons for the General Electric Co. office at Buffalo, which has been postponed. The contractors are asking for about 1,500 tons of shapes for state barge canal construction.

The Geo. A. Fuller Co. has the general contract for the Bamberger store, Newark, N. J., but the steel, 6,000 tons, is still pending. The Metropolitan Bridge Co. has about 200 tons for an addition to the Childs restaurant at Park Place, this city. Action is scheduled to be taken this week on the Jarmulowsky bank building, on Canal street, this city, 1,200 tons. The American Radiator Co. is expected to come out soon with plans for some work at Bayonne, N. J. We quote, for delivery at tidewater, as follows:

**Angles, 3 to 6 inches and heavier, 1.56c to 1.61c; tees, 3 x ¼ inch and heavier, 1.56c to 1.61c; plates, carload, tank, 1.56c to 1.61c; boiler steel, 1.66c to 1.71c; marine boiler, 1.96c to 2.01c; bar iron, 1.30c to 1.35c; soft steel bars, 1.56c to 1.61c.**

**Old Material.**—The market continues in a more or less listless state, as it is difficult to interest buyers on sizeable lots, except at their own prices, and dealers are not disposed to commit themselves extensively, owing to the material not being freely available at current values. Dealings, accordingly, are of a hand to

mouth nature and in small lots for immediate requirements, but these show no great variation in prices. We quote, gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

| | |
|---|---|
| Old car wheels | $11.50 to 12.00 |
| Old iron axles | 21.50 to 12.00 |
| Old steel shafting | 15.50 to 16.00 |
| Heavy melting steel | 10.75 to 11.00 |
| No. 1 R. R. wrought | 13.00 to 13.50 |
| Iron track scrap | 12.00 to 12.50 |
| Wrought pipe | 10.00 to 10.50 |
| Cast borings | 5.75 to 6.00 |
| Wrought turnings | 6.00 to 6.50 |
| Heavy cast scrap | 11.50 to 12.00 |
| Railroad, malleable | 10.00 to 10.50 |
| Stove plate | 9.00 to 9.50 |
| Grate bars | 9.00 to 9.50 |

## ST LOUIS

### Pig Iron Business Limited Both as to Inquiry and Sales.

May 22.

**Pig Iron.**—Transactions in pig iron are limited to very small lots, and few of them, in the St. Louis territory. One sale of 1,000 tons of malleable was reported this morning as made to a concern in Iowa last week, but denial of such a transaction has been made. There is virtually no inquiry out, and consumers say they have plenty of iron for their immediate needs. Certain grades of southern silicon iron can be bought readily at $10.50. Northern iron remains at $13.75 to $14, Ironton, with almost no demand. Prices on southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

| | |
|---|---|
| Southern No. 1 | $14.75 |
| Southern No. 2 | 14.25 |
| Southern No. 3 | 14.00 |
| Southern No. 4 | 13.75 |

**Coke.**—One sale of 15 to 16 tons of foundry coke is reported to have been made last week, and several for smaller lots. The market is quiet, with a possible shading of 10 cents a ton for spot shipments. Prices are as follows:

We quote 72-hour Connellsville foundry grades, $1.90 to $2.40 for whole of 1911; 72-hour foundry, $1.90 to $2.15 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.40 to $1.50; best 72-hour Virginia foundry, $1.90 to $2.15; 48-hour Virginia furnace, $1.50 to $1.75. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

**Finished Material.**—Structural material is in good demand, and prices are maintained without difficulty. The demand for bars is fair. Standard steel rails are moving nicely, and quite a number of interurban projects are expected to materialize within the next 30 days to six months, which will result in considerable buying. Track fastenings are in fair demand. Some of the large dealers insist that business in finished material is very good, and that prospects for an improvement are bright.

**Old Material.**—Transactions in scrap iron remain almost at a standstill, with some shading of prices. Quotations remain nominally as follows:

| | |
|---|---|
| Old car wheels | $13.00 to 13.50 |
| Old iron rails | 14.00 to 14.50 |
| Rerolling rails (4 ft. and over) | 12.50 to 13.00 |
| Old steel rails (2 ft. and under) | 11.50 to 12.00 |
| Light section relayers, 45 lbs. and under, subject to inspection | 21.00 to 23.00 |
| Relaying rails, subject to inspection | 24.50 to 25.00 |
| Frogs, switches and guards | 12.00 to 12.50 |
| Heavy melting steel | 12.00 to 12.50 |
| Shoveling steel | 12.00 to 12.50 |

We quote, net tons, as follows:

| | |
|---|---|
| No. 1 R. R. wrought | $11.50 to 12.00 |
| No. 2 R. R. wrought | 10.50 to 11.00 |
| Arch bars and transoms | 13.50 to 14.00 |
| Knuckles, couplers and springs | 12.00 to 12.50 |
| Shafting | 14.50 to 15.00 |
| Iron car axles | 18.00 to 18.50 |
| Steel car axles | 18.00 to 18.50 |
| Locomotive tires | 14.00 to 14.50 |
| No. 1 country wrought | 9.25 to 9.75 |
| Pipes and flues | 8.50 to 9.00 |
| No. 1 busheling | 9.75 to 10.25 |
| No. 2 busheling | 6.50 to 7.00 |
| No. 1 boiler cut | 8.50 to 9.00 |
| Boiler punchings | 9.75 to 10.25 |
| Cast and mixed borings | 5.00 to 5.50 |
| Machine shop turnings | 7.00 to 7.50 |
| Railroad malleable | 9.50 to 10.00 |
| Agricultural malleable | 8.50 to 9.00 |
| Stove plate | 9.50 to 10.00 |
| Angle splice bars, iron | 12.25 to 12.50 |
| Angle splice bars, steel | 11.00 to 11.50 |

## BUFFALO

### Inquiry Fairly Active.—Canadian Inquiry Still Pending.

May 22.

**Pig Iron.**—The opening of this week showed an improvement in the general sentiment and a fairly large tonnage not yet closed. The business closed in the preceding week is estimated at between 5,000 and 7,000 tons, mostly in small lots. A Canadian inquiry for 2,500 tons of basic is still under negotiation. Some of the foundries are busy while others are slack, depending on circumstances. There is a tendency toward firmer prices. We quote f. o. b. furnace as follows:

| | |
|---|---|
| No. 1X | $14.00 to 14.50 |
| No. 2X | 13.50 to 13.75 |
| No. 2 plain | 13.50 to 13.75 |
| No. 3 | 13.25 to 13.50 |
| Gray forge | 13.00 to 13.25 |
| Malleable | 14.00 to 14.50 |
| Basic | 14.25 to 14.75 |
| Charcoal | 16.50 to 17.50 |

**Finished Products.**—The demand for fabricated structural material continues active, but it is mostly for immediate shipment as buyers have been holding off. At least two of the large structural contracts that have been pending for some time will be let in the next few days and among the jobs that will be figured in the near future is the new Hutchison high school, which will require a large tonnage, but no official announcement concerning this building has been made by the city. Bars are not particularly active. Canadian business in almost all lines of finished products continues good.

**Old Material.**—A few small sales of scrap are reported, but the market is still inactive, and the prices here quoted are largely nominal. We quote gross tons f. o. b. Buffalo, as follows:

| | |
|---|---|
| Heavy melting steel | $12.75 to 13.00 |
| No. 1 railroad wrought scrap | 14.75 to 15.25 |
| No. 1 railroad and machine cast scrap | 14.00 to 14.50 |
| Old steel axles | 18.50 to 19.00 |
| Iron axles | 23.00 to 24.00 |
| Car wheels | 13.75 to 14.25 |
| Railroad malleable scrap | 13.75 to 14.00 |
| Machine shop turnings | 7.00 to 7.25 |
| Cast iron borings | 6.50 to 6.75 |
| Low phosphorus steel scrap | 17.00 to 17.50 |
| Old iron rails | 16.75 to 17.25 |
| Tank iron | 10.75 to 11.25 |
| Sheet iron | 6.50 to 7.00 |
| Pipes and flues | 10.75 to 11.25 |
| Stove plate | 12.00 to 12-50 |
| Grate bars | 11.50 to 12.00 |
| Boiler plate | 11.50 to 12.00 |

## BIRMINGHAM

### Moderate Sales at Concessions—Slight Increase of Stocks.

May 22.

**Pig Iron.**—Some large sales have been made by one or two of the leading iron interests here this week, and admittedly at concessions below the $11 schedule. Several thousand tons were booked for shipment over the next several months. Still others report orders coming in for lots of 25 to 500 tons at the $11 price. There is still a large tonnage of iron on furnace yards, and the buyers generally are well aware of this fact; so that it appears it would take a very heavy buying movement to really add a great deal of strength to the situation. If one or two large interests should come in the market and take as much as 100,000 tons, it would undoubtedly have the effect of immediately stiffening the situation and firmly establishing the $11 schedule; but it is very doubtful if even a price of $10 would induce the purchase of such a tonnage. Shipments are very fair thus far this month, but it is thought stocks on hand June 1 will show some increase over May 1, though slight.

The Ensley steel mill is ready to resume in June, and several nice orders for rails have been booked by the Tennessee company.

**Cast Iron Pipe.**—The general inquiry from different portions of the country for water pipe continues good, with the result that manufacturers are holding prices very firm. San Diego has specifications before local producers for about 7,000 tons, which it is thought will be closed for soon, and

it is expected Alabama foundries will get the business. This is by far the most interesting proposition being considered, and if the order is landed for Alabama pipe, it will tend to still further strengthen the market. The prices are firmly held at $23 for 4-inch to 6-inch; $22 for 8-inch to 12-inch, and an average of $21 for over 12 inches,—all per ton of 2,000 pounds on board cars here, with customary differential of $1 higher for gas pipe.

**Coal and Coke.**—Alabama foundry coke continues fairly active, as this is the season when foundries usually close their requirements for the next period of 12 months. Good Alabama foundry is very firm at $3.50, ovens, while the best brands of Virginia coke are $2 to $2.25 at the ovens. Furnace or 48-hour coke is in very slack demand, with prices correspondingly dull. The coal market is very poor, as it appears there is quite an overproduction just now, due to the general dullness in the iron and steel business of the south. Every idle furnace means quite a decrease in the output of coal, and the coal miners are feeling very keenly the effects of a poor iron market.

## SEATTLE

### Stop Put to Importation of Foreign Iron on the Pacific Coast.

May 18.

**Pig Iron.**—An unexpected advance in the charter rates for foreign shipments which was put into effect recently has practically put an end to any importation of foreign iron on the Pacific coast. The only firm that is getting any material from abroad is the Western Steel Corporation, which continues to buy its iron at Hankow, China. A few dealers have a small supply of Glengarnock iron, but it is moving slowly and most of the consumers are relying on the Southern grades, which have entered the section strongly recently. The foreign iron in hand is moving at the same prices as recently quoted, which is practically rock bottom for the jobbers. We quote foreign iron in gross tons, ex-ship Puget Sound or Columbia river delivery f. o. b. Pacific coast terminals as follows:

| | Prompt. | Third quarter. |
|---|---|---|
| No. 1 Glengarnock | $23.50 | $23.50 |
| No. 1 Eglinton | 22.50 | 23.00 |
| No. 1 English Jarrow | 22.50 | 22.50 |
| No. 1 Chinese Hanyang | 22.00 | 22.00 |
| No. 1 Cleveland | 22.50 | 22.50 |
| English Doncaster | 22.00 | 22.00 |

**Finished Material.**—Municipal buying has been particularly heavy during the past month and rules the market at present. The northwest cities are making some large improvements and these are giving a call for large deliveries of sheets and bars aside from a good demand for machine tools and power plant equipment. The latter is also in good demand in a private way as with the breaking of the snows in the mountain districts the plants having irrigation systems and other projects on hand are beginning to construct their operating bases.

## San Francisco

### Building Projects Will Require Large Tonnages—Municipal Lettings.

May 18.

**Pig Iron.**—There is little to note in the pig iron market, demands being light and stocks ample. A slight disposition to shade on future arrivals is noticed. We quote:

| | |
|---|---|
| Heroult | $25.00 |
| Continental | $22.50 to 23.00 |
| Chinese | 23.00 |
| English | 22.50 to 23.00 |
| Southern No. 2, f. o. b. | 21.00 to 22.00 |

**Merchant Pipe.**—The city of Los Angeles will let the contract for 60,000 feet of 1 to 2-inch and 10,000 feet of 3 to 4-inch galvanized pipe this week. Many extensions are planned for the central portion of the state and the new Oakland city hall will call for a fair-sized order of this material. Two gas pipe lines are to be built in the oil regions in the near future.

**Plates.**—The demand for material for steel tanks of various sizes is increasing and considerable business in this line is expected from now on. The city of Los Angeles will open bids on May 26 for steel and rivets for 1,865 feet of 9 feet 3-inch pipe; 5,163 feet of 10-inch, and 8,313 feet of 11-inch pipe. A large number of oil tank orders are in prospect, also storage tanks for municipal water systems of some of the smaller towns. The Western Water Company is to erect a 100,000-barrel tank at Taft, Cal.

**Old Material.**—Little demand is noted for cast scrap and very little is being offered. Prices remain the same. Some steel scrap is being exported. Wrought scrap continues plentiful with a limited demand. Re-rolling rails are in light demand. We quote:

## British Iron Markets

### Furnaces Blowing Out, Since Buyers Will Not Close.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 13.

The position of the pig iron market in all the British districts is unsatisfactory, and to some extent, puzzling. Prices everywhere are considered to have reached a minimum, and furnaces are being blown out both in the Midlands and in the North. The statistics of the Cleveland iron market are favorable for prices. Shipments of pig iron are 13 per cent better this week than a month ago and the stocks in Connal's stores have been decreasing, but in spite of all this prices have shown no tendency to rise. They have indeed continued to fall, and the prices at Thursday's market were the lowest known for six years, buyers offering only 45s 8½d ($11.19) cash, the worst price previously having been 45s 9d ($11.20) on Tuesday. The quoted price for No. 3 Cleveland G. M. B. pig iron has dropped to 46s per ton for prompt f. o. b. delivery, the worst figure since 1905, but buyers still show a disposition to wait for lower prices. Mixed numbers of E. C. hematite pig iron may be obtained at 61s 6d ($15.06) per ton for prompt delivery, but the general quotation is 62s ($15.18). The quotation for rubio ore continues nominally at 21s per ton, but no business is doing.

Business continues slow in finished iron and steel, but manufacturers, generally speaking, are not badly off for orders and their quotations are for the present maintained. Belgian competition is still keenly felt in the Midlands, both in bars and in common iron for nut and bolt making. There has been a better demand for galvanized sheets for export and price cutting is not quite so severe as it was a week or two ago. The Sheffield tool trade is fairly well employed, but buyers complain of delays in delivery, and it is said that orders placed in Germany and in the United States are executed more promptly. In the North, complaints of quietude in the steel trade are increasing, and some of the works are not fully employed.

The Middlesbrough iron and steel firm of Dorman Long & Co., has declared an interim dividend at the rate of 5 per cent. The interim dividend this time last year was 4 per cent.

# METAL MARKETS

## New York.

May 23.

**Tin.**—Foreign pig tin prices have displayed conspicuous strength all through the week, and at the close of the London market today both positions showed gains over the last quotations of May 16. The advance in spot value, however, is far out of proportion with future positions. The former closed at £203, up £5 10s, and the latter at £191, up 10s. The volume of business has been light in

both positions compared with the enhancement of values. This fact affords strong proof of how completely the tin situation is dominated by the syndicate, through its control of the supplies of Straits tin. It is generally conceded that it is well within the possible that the high prices of 1906 when spot sold at £215, may be exceeded some time within the next six months. The local demand showed some improvement in the early part of the week, but the recent advance has caused considerable caution among all classes of buyers. There is a noticeable decrease in spot, and nearby offerings in this market, indicating that domestic supplies have declined. Small sales of export were made today at 44c and 44.50c was asked at the close. Tin arrivals since May 1, aggregate 2,194 tons. The afloat is 945 tons, and it is unlikely that more than 300 tons of this will arrive in time for May delivery.

**Copper.**—There is a decidedly better sentiment in the local market for copper metal. Business, however, shows little, if any, improvement, except in a speculative way. Buyers of that class display a more hopeful view of the future as regards a closer working relation among the producers of copper, and have advanced the foreign warrant market £1 5s since May 16. The leading interests have refused 12.15c, delivered 30 days, for electrolytic, it is reported, and are holding firmly at 12.25c, delivered. Lake is 12.25c to 12.37½c. Spot standard closed today in London at £55, and three months at £55 12s 6d. Copper exports since May 1 aggregate 20,722 tons.

**Lead.**—The demand for pig lead continues light. Outside sellers are satisfying the local inquiries at from 4.40c to 4.42½c. The leading interest has made no change in its shipment quotation of 4.50c.

**Spelter.**—The market has been soft and the price has declined to 5.35c for prompt shipments to New York from the west. Consumers show little interest in the metal.

**Antimony.**—Cookson's and Hallett's antimony is held firm at 9.50c and 9c respectively but Chinese and Hungarian have been sold recently at 7.87½c. The demand is very light and concessions are readily made to secure business.

## St. Louis.

May 22.

**Lead and Zinc.**—The top price paid for zinc ore in the Missouri-Kansas-Oklahoma district last week was $43 a ton, with 60 per cent grades bringing $37 to $40. The average price paid was $37.50. The demand was decidedly brisk, and sales exceeded the production, reducing the surplus in some camps. At the close of the week, spelter was selling at East St. Louis at 5.20c, as against 5.425c at the close of the previous week. The Zinc Ore Producers' Association, which was organized a year ago, met last week and elected a new board of directors, which was taken as an indication that the contract system has been a success, at least to some extent. Calamine ranged from $19 to $22 for 40 per cent grades last week, with choice lots bringing $26. Pig lead at East St. Louis remained at 4.25c at the close of the week, unchanged from the previous week. Lead ore was selling at $56 to $58 for 80 per cent grades at the close of the week.

## Chicago.

May 22.

**New Metals.**—In sympathy with the New York market, copper was firm and buoyant the latter part of last week, although there was not much in the local situation to justify an increase in price. It is reported that all the large copper producers in the west are well sold ahead. Spelter declined during the week and is now quoted 5.25c, Chicago. Current quotations on tin are 43½c, Chicago. Lead and spelter are inactive.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

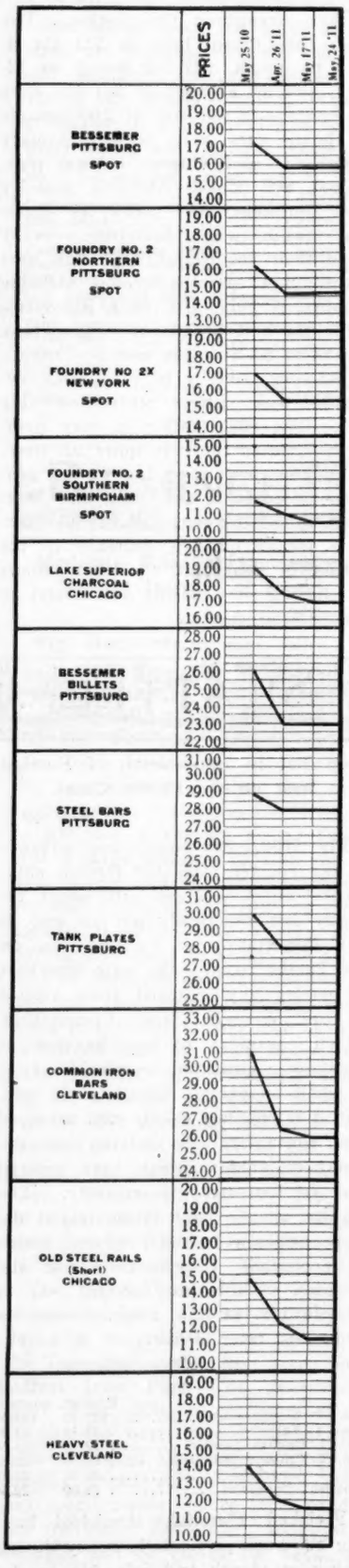
Lake copper, carload lots, 12½c; casting, 12⅜c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.25c to 5.30c; lead, desilverized, 4.32½c to 4.35c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $7.25 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 43½c; Cookson's antimony, 10¼c; other grades, 9c to 10c.

**Old Metals.**—The market for old metals is lifeless and devoid of interesting features. Sales are slow and prices continue to drag.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, 12c; heavy copper, 11⅞c; light copper, 11c; heavy red brass, 10½c; heavy yellow brass, 9c; light brass, 7c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 7½c; brass clippings, 8½c; tea lead, 3.80c; lead scrap, 4½c; zinc, 4½c; tin pipe, 37c; tin foil, 34c; pewter, 27c; electrotype plates, free from wood, 4c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; linotype dross, 3¼c; prime slab zinc dross, $75 per ton.

## PRICE CHART



## REPORTS OF CUTTING

**Have Some Effect.—But Sentiment Still Optimistic.**

New York, May 24. (By wire.)

Reports of sales of steel bars at concessions and contemplated cuts in other lines, though pronounced unfounded by makers, are having some disturbing influence on the market and are causing buyers to hold back orders. Sentiment, however, continues improved. Rail sales are small, with but one lot of 10,000 tons, pending in the east. The Carnegie Steel Co. reports 2,000 sold to Z. W. Davis, contractor, 600 to the Buffalo, Rochester and Pittsburg and 500 to the McClintic-Marshall Construction Co. The Carnegie Steel Co. will furnish about 3,500 tons of H beams to contractors for the final portion of the Catskill Aqueduct and 2,000 tons of concrete bars also required. General contracts have not yet been placed.

## New Structural Contracts in the East

New York, May 24. (By wire.)

A great many small structural contracts are coming out in the east. Among the late awards, the York Bridge Works has 1,700 tons for viaducts at Syracuse. The Jones & Laughlin Steel Co. has 900 for the Fire Association building, Philadelphia. The Radley Iron Works has 900 for the McGibbon loft, Thirty-seventh street, this city. Bids are in for 1,200 tons for buildings of the Armour Co., Chrome, N. J., 1,000 tons for American Radiator Co.'s warehouse at Bayonne, N. J., and 1,000 tons for the new plant of Peck, Stowe & Wilcox, Southington, Conn.

## Foreign Rail Sales

A few nice inquiries have come before makers this week, comprising one for 54,000 tons of 42's and 65's for Queensland, one for 30,000 tons of heavy section for the Union of South Africa, and a third for 6,000 tons of 80's for Ceylon. Business is also expected from Victoria. Actual bookings during the week have not amounted to anything of importance.—*The Ironmonger,* London, May 13.

**Warehouse Destroyed.**—The Brown & Zortman Machine Co. advises that its warehouse and office building, Liberty avenue, Pittsburg, were destroyed by fire, May 20. The loss is fully covered by insurance. While the stock was damaged, the factories are in good shape and the company announces that it is prepared to go ahead with business at the old location. The plant of the Reinforced Brazing & Machine Co., which adjoins the Brown & Zortman Machinery Co.'s plant, was also badly damaged by fire.

## Plates and Shapes for Battleship

Washington, May 23.

The following awards of plates and shapes for the battleship New York have been made:

To Worth Bros.: 6,218 tons medium steel plates, $234,473.56; 900 tons high tensile plates, $7,702.60.

To Carnegie Steel Co.: 140 tons medium steel plates, $6,146; 1,600 tons special treatment plates, $454,448; 30 tons common checkered plates, $1,740.30; 10 tons high tensile steel angles, $611.50; 2,409 tons angles, channels and zees, $89,546.46.

The companies made affidavit to the effect that they are not engaged in restraining trade.

The bids were opened Dec. 13, and published in the Daily IRON TRADE REVIEW of Dec. 15.

## Reorganizing Turbine Company

The Kerr Turbine Co., Wellsville, N. Y., has just been reorganized and $125,000 new capital added. The stock interests of the company are now controlled by F. P. Merrill, of Hornell, N. Y., and P. B. Hanks, of Wellsville, who, as trustees, have directed the affairs of this company for the past two and a half years. Mr. Kerr is no longer with the company, his position as chief engineer now being filled by J. L. Moore, formerly a designer with the Westinghouse Electric & Mfg. Co., and later in the engineering department of the Santa Fe railroad. The present plant will be materially enlarged and a new machine shop is already in course of erection. It is the intention of the new company to incorporate into the Kerr turbine, design, changes which are based upon two years' experiments and which will improve the steam economy on all sizes by from 15 to 20 per cent.

## Low Price for Basic

Pittsburg, May 24. (By wire.)

Two lots of basic pig iron aggregating about 1,000 tons have been sold on a basis of $13.10 valley, but the iron did not come from valley furnaces or a regular seller of pig iron. Consumers of basic and foundry iron will be obliged to buy a moderately heavy tonnage for third quarter shipment.

## Pig Iron Stocks Not Increasing Rapidly

Further curtailment of furnace operations in Pittsburg and Ohio territory is cutting down the rate of increase in pig iron stocks in these districts. During the first half of May, the increase in stocks was 5,000 tons, compared with a gain of 13,000 tons, the last half of April. Total stocks in these territories are now about 880,000 tons, exclusive of those of the Steel Corporation. Among the independent merchant and steel works furnaces of these districts, 34 stacks are now blowing and 23 are idle, which is a reduction of 3 from the active list of the two weeks preceding. The heaviest stocks of iron in the central west are in basic. There are also large accumulations of Bessemer and foundry iron. The latest statistics from the Alabama districts show the total stocks there to be about 265,000 tons, of which less than 30,000 tons is basic, and the remainder foundry grades. The Steel Corporation is starting this week the two additional furnaces recently ordered in. Its pig iron stacks now show a small rate of decline.

## Ohio Engineers Meet

The annual meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers was held at Youngstown, O., May 18 and 19, Oscar T. Rabbe, of Toledo, O., president, presiding. In addition to the business transacted, the members present made a number of excursions through the plants of the Youngstown Sheet & Tube Co., the Ohio works of the Carnegie Steel Co., the General Fireproofing Co., the Trussed Concrete Steel Co., the Republic Rubber Co., and other plants in the vicinity of Youngstown. Papers read were as follows: "Flue Gas Analysis," by Joseph W. Hays, Chicago; "Industrial Motor Control," by D. Martignone, of the General Electric Co., Cleveland; "Load Regulation by Means of Storage Batteries," by J. H. Tracy, and "Centrifugal Blowers," by Dr. Lowenstine of the General Electric Co., Schnectady, N. Y.

The Alan Wood Iron & Steel Co. is now operating four of its nine open hearth steel furnaces at its steel plant at Ivy Rock, Pa., but this capacity with hot metal charging from the blast furnaces at Swedeland, Pa., is producing tonnage at as high a rate as a larger number of furnaces previously active on cold material.

## CORPORATION TAX

**May be Increased to Make Up Deficit Due to Tariff Changes.**

Washington, May .23.

In quest of some means to prevent the only too obvious danger of disastrous reductions in the national revenue as a result of their proposed tariff revision, house Democrats under the leadership of Representative Ansberry, of Ohio, have considered in caucus the promulgation of a most remarkable measure. It is proposed to increase gradually on a sliding scale the present corporation tax; thus effecting the double object of making up the inevitable revenue deficit and of eventually forcing the automatic dissolution of great industrial combinations into their component companies by the imposition of a prohibitive excise tax.

The Democratic leaders estimate that the present plans will subtract $10,000,000 from the revenue; the Republicans think that it will be nearer $50,000,000.

## Will Soon Hold Conferences

The first joint conference between the wage scale committee of the Amalgamated Association of Iron, Steel & Tin Workers and the Western Bar Iron Association will be held probably at Cambridge Springs, Pa., during the week beginning June 5. The annual wage scale conference with officials of the Republic Iron & Steel Co. will probably be held the same week, and this will be followed by meetings with officials of the sheet and tin plate companies employing union labor. The Amalgamated Association will not ask for any changes in the base wage scales, but from 10 to 12 changes in the foot notes will be requested.

## Steamer Launched

The steamer Perfection, building at the Cleveland yard of the American Ship Building Co. for the Standard Oil Co., was launched on Saturday last, being the first of seven under construction to go overboard. The Perfection is 260 feet over all, 250 feet keel, 43 feet beam and 23 feet deep. She will go into commission in about six weeks and will be sent to the coast in the fall.

Eugene Tyler Chamberlain, commissioner of navigation, has resigned. Mr. Chamberlain was appointed commissioner of navigation by President Cleveland 18 years ago and has held the office continuously since under successive presidents. Prior to his appointment, he was associated with the Albany Argus as an editorial writer. Mr. Chamberlain was a firm advocate of subsidies for American ships in the oversea trade. His resignation is a distinct loss to the service.

## Decision Important to Bridge Builders

Louisville, Ky., May 23.

The Kentucky court of appeals has made a decision important to bridge-builders, holding in the case of the Oswego Bridge Co. that a contract with a committee of a county court is not sufficient, and that to be binding the agreement must be with the entire fiscal court. The company has no other resource to recover on $15,000 of bridges erected for the Floyd County Court than to dismantle the structures.

The Oregonia Bridge Co., of Lebanon, O., has been awarded the contract for the erection of a steel bridge over Drake's Creek in Warren county, Ky. The contract price is $4,200.

The Champion Bridge Co., of Wilmington, O., has been awarded the contract for the erection of three bridges in Edmonton county, amounting to $8,200.

## Elected Vice President

D. W. Weir, formerly secretary and manager of the Phillips Sheet & Tin Plate Co., operating mills at Weirton and Clarksburg, W. Va., has been elected vice president and secretary of the same company.

**For Daily Records.**—J. H. Hillman & Son, Pittsburg, are distributing a very attractive loose leaf pocket blast furnace daily report book to superintendents of blast furnaces. The book is 4½ x 7 inches, and contains a sufficient number of leaves to keep daily records for six months. The leaves are so arranged as to keep a complete report of all material consumed as well as all materials produced, and all details of practice. There are three celluloid leaves for protection against steam and dirt, through which the reports can easily be read.

Quincy Mining Co. has declared a quarterly dividend of $1 a share, payable June 19.

## CARNEGIE EXCUSED

**From Appearing Before Investigators Until Fall.**

Washington May 23.

The select committee of the house created under the Stanley resolution to investigate the United States Steel Corporation and its status as regards the Sherman act has had its first meeting and organized with Mr. Stanley as chairman and his secretary, B. J. Hunter, as clerk.

A wire from Representative Stanley last night excused Andrew Carnegie from attendance at the hearings of the Stanley committee until his return from Europe early next fall. This indicates that early hearings will be devoted to purely preliminary matters. Mr. Carnegie had signified his willingness to appear without being served by subpena or any legal document. The committee has adjourned sine die. In an interview this morning the minority leader, Mr. Mann, said that he now has nobody in mind for nomination to fill the Republican vacancy on the committee.

## Contracts About to be Placed

Contracts for the superstructure of the blast furnaces at the new plant of the Minnesota Steel Co. now under construction at Duluth are about to be placed, the foundation work having been completed. Two furnaces are being erected. Similar contracts are also about to be let for the open-hearth furnaces of the steel works, as the foundations for these have also been completed. A number of the auxiliary buildings for the new plant, including machine shops, power house and other units have been practically finished for some time.

**Has Incorporated.**—The New Haven Machine Screw Co., New Haven, Conn., manufacturer of machine screw products, has been incorporated after four years' existence as a partnership. These officers have been elected: President, J. J. Reidy; treasurer, Pierrepont B. Foster; secretary, D. F. Reidy. President Reidy has had 21 years experience in the machine screw business; Treasurer Foster is a director of the Yale National bank, of New Haven. The company will increase its plant capacity, having placed orders for considerable equipment additional.

## Personal

F. G. Coffeen, of Chicago, has been named metallurgist with the Malleable Iron & Steel Co., Syracuse, N. Y.

Joseph Boyer, president of the Burroughs Adding Machine Co., has been chosen a director of the General Motors Co.

Wolcott Remington, well known as a designer and manufacturer of oil engines, has associated himself with the Blanchard Machine Co., Cambridge, Mass.

These directors of the Pennsylvania Steel Co. were re-elected recently at the annual meeting: B. Dawson Coleman, Theo. N. Ely, G. H. B. Martin and F. W. Wood.

Clarence A. Bartlett has accepted a position with the Garry Iron & Steel Co., of Niles, O., as sales agent traveling out of Philadelphia and working through the states of New Jersey, Maryland, Virginia, Pennsylvania and Delaware.

Charles W. Cade has resigned as foundry manager of the Blake & Knowles Steam Pump Works, of East Cambridge, Mass., which position he had held for the last eight years. Mr. Cade is at present engaged in consulting work.

Walter B. Snow, publicity engineer, 170 Summer street, Boston, has recently added to his staff, John S. Nicholl, late of the New York Edison Co. and formerly acting manager for F. W. Horne, importer of American machinery, Yokohama, Japan.

H. A. Hunt has been appointed eastern sales agent of the Edgar Allen American Manganese Steel Co., with headquarters at New Castle, Del. The appointment was made in order to fill the vacancy caused by the resignation of V. W. Mason jr. The change noted is effective as of May 16.

Frank C. Lewis, formerly western manager for the Colonial Steel Co. since it was established, and James S. Lewis, also with the same company, have resigned their positions to accept similar ones in the tool steel department of Charles G. Stevens Co., Chicago. Frank C. Lewis will be manager of this department, and associated with him and assisting him will be James S. Lewis. Both are well known tool steel salesmen.

E. A. McKelvey, formerly Pittsburg salesman for the Harbison-Walker Refractories Co., and R. A. MacDonald, western Pennsylvania and Ohio representative of the same company, have severed their connections with the Harbison-Walker company and have been appointed sales managers for the General Refractories Co. The general sales offices will be suite 1243 Oliver building, Pittsburg.

## Death of W. W. Sly

William W. Sly, president of the W. W. Sly Mfg. Co., Cleveland, died in that city, May 22, of pneumonia and complications. Mr. Sly was born in Oakland county, Mich., in 1834, and after receiving his education, he taught school for a number of years. Later he became interested in the foundry supply business and established the W. W. Sly Mfg. Co., in Cleveland, in 1874, the firm being incorporated in 1903. In this business Mr. Sly formed a wide acquaintance among foundrymen. He was especially known for the part

WILLIAM W. SLY.

he took in the development of tumbling barrels, dust arresters and other modern cleaning room equipment. At the time of his death he was working toward the perfection of sand blast machinery. Mr. Sly was a member of the G. A. R. His son, Wilfred C. Sly, is secretary of the Sly company.

## Obituary

Samuel J. Catherman, a pioneer in the construction of modern railway coaches, died at Sandusky, O., May 19, aged 93.

Mark N. Foster, aged 58, who organized the Iron City Spring Co., of Pittsburg, some years ago, died May 20 at his home in Sheraden, Pa., near Pittsburg.

Gerald C. Smith, aged 67, president of the Sterling White Lead Co., and one of the organizers of the Sterling Steel Co., organized some years ago, died May 20 at the West Penn hospital, Pittsburg.

Henry W. Corwin, aged 85, formerly connected with the Cotton & Hogg Iron & Steel Co., died May 16 at his home in Pittsburg. Mr. Corwin was identified with the Cotton & Hogg Iron & Steel Co. for 33 years, having retired about 10 years ago.

Col. Henry O. Seixas, a director of the Columbus & Hocking Coal & Iron Co., the Davis Coal & Coke Co., the Lanston Monotype Machine Co. and the Sloss-Sheffield Steel & Iron Co., committed suicide by shooting in New York City, May 19, aged 70.

A. N. Spencer, vice president and general manager of the Oliver Machinery Co., Grand Rapids, Mich., died unexpectedly of heart failure on May 18. He was widely known throughout the country, his 28 years of experience in the woodworking machinery business having placed him among the leaders in this class of business. He had been in direct charge of all matters of the company having to do with advertising.

Prof. Nathaniel Wright Lord, professor of metallurgy and director of the school of mines at Ohio State University, Columbus, died May 23, aged 56. Death was due to heart trouble, superinduced by a stroke suffered after being overcome by heat. He was born in Cincinnati, was graduated from Columbia University and first went to Ohio State University in 1877. He was widely known as an authority on mines and mining, his services as an expert being in demand. He was the author of a number of books. His brother, H. C. Lord, is professor of astronomy at Ohio State.

## Locomotive Orders

The Duluth, Winnipeg & Pacific railroad has placed an order for five consolidation freight locomotives with the American Locomotive Co. The Buffalo Creek railroad has also ordered one six-wheel switching type locomotive from the same builder.

The Baldwin Locomotive Works, Philadelphia, has booked an order for 20 locomotives for delivery in New South Wales.

The Pennsylvania Steel Co. has been awarded the contract for furnishing a quantity of track specials for the Geary Street Municipal Railroad at San Francisco, the price agreed upon being $45,713.

The Crucible Steel Co. of America has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable June 30.

# The Foundrymen's Convention at Pittsburg

## Report of the First Day's Proceedings—Opening of the Big Exhibit of Foundry Equipment, Machine Tools, etc.

Presentation of interesting papers on modern cost systems and cupola management occupied the first day's session at the Pittsburg convention of the American Foundrymen's Association and allied bodies, May 23. The professional sessions opened in the auditorium of the Exposition buildings at 10 a. m., with Mayor J. T. Speer presiding. Cordial addresses of welcome were given by representatives of the city of Pittsburg and the chamber of commerce, to which as cordial a response was made by A. D Howard, vice president of the American Foundrymen's Association.

Mayor Speer, in his brief annual address, pointed out that great strides have been made in the past few years in the science and art of founding as a result of co-operation and interchange of ideas among foundrymen. He also commented on the prevailing unsatisfactory business conditions, but expressed firm belief in an early return of good times.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, in his annual report, said that for the first time in the history of the organization the transactions have been sent to the membership in bound form. He said that much progress has been made in the development of the permanent mold and in continuous melting practice. His report showed a total membership of 692 and a balance in the treasury of $1,541.95. The association is in unusually excellent financial condition.

Reports were also read by the president and secretary of the American Brass Founders' Association, which showed that this organization is in a flourishing condition.

### Papers Read.

The papers read on Tuesday were:

"Production Costs," by Ellsworth Taylor.

"Economical Insurance for Foundry Properties," by S. G. Walker.

"Foundry Costs," by F. E. Weber.

"Why Cost Systems Fail," by S. E. Nold.

"Standard Test Bar for Cast Iron," by Richard Moldenke.

"Cupola Melting Practice," by P. Munnoch.

"Cupola Practice," by R. H. Palmer.

"The Briquetting of Metal Borings," by Dr. Richard Moldenke.

"Mechanical Charging of Cupola," by G. R. Brandon.

"Progress in Heated Foundry Mixers," by J. B. Nau.

"Titanium in Iron Castings," by Chas. V. Slocum.

"Defective Castings," by John M. Perkins.

"Molding Machine Practice," by E. H. Mumford.

"Machine vs. Hand Molding," by John Alexander.

Mr. Taylor's paper gave the following formula for obtaining the actual cost of an individual casting or class of castings:

(1) Multiply weight of the casting or class of castings by the net cost of the metals consumed.

(2) Add the cost of direct labor used.

(3) Multiply the weight by the per pound unit covering all indirect costs to be distributed on a basis of weight of good castings.

Mr. Taylor scored the average foundry cost-keeping system severely, saying that the greatest commercial weakness of the foundry industry today is lack of appreciation of sound business methods.

### Cupola Practice.

The discussion of cupola practice in the afternoon developed comment on the necessity of charging light, even layers and the advantage of adjusting the bed charge so as to get the iron at the proper time, in from eight to ten minutes after turning on the bast. This insures the iron being melted at the proper point in the cupola.

Dr. Moldenke's paper on "Briquetting Metal Borings" brought out some very interesting features of European practice, particularly German, in this line. The borings are compressed in special machines under pressure of 35,000 pounds per square inch, and time enough is allowed to let the air escape from the briquette. Briquettes can be used alone in a cupola with a melting loss of 8 per cent, but when charged with other metals the total loss is reduced to 3½ per cent.

### The Exhibit.

A large crowd attended the formal opening, Tuesday evening, of the exhibit of foundry equipment, machine tools and appliances, which is being held in the buildings of the Western Penn. Exposition Society. Molding machines of large capacity, heavy machine tools, furnaces, etc., are being displayed in Machinery Hall, and practically all of this equipment is shown in operation. A feature of the exhibit is the permanent mold foundry installed by Edgar A. Custer, of Tacony, Philadelphia. Throughout the remainder of the week castings will be poured in these cast iron molds, the iron being melted in a Whiting cupola. The exhibits total 112 and far exceed the number of displays made at any previous show. In the main building, light equipment, foundry supplies and accessories are shown. To enable the members of the American Society of Mechanical Engineers, whose meeting will be held in Pittsburg next week, to attend the exhibit, it has been decided to continue the show until Thursday, June 1.

# Titanium in Steel Castings*

*By Charles V. Slocum*

Practically all steel makers endeavor to fully deoxide their steel by using more or less of the well-known deoxidizers, manganese and silicon. The melters also try to remove other shortcomings with these elements. For instance, the metal is sometimes overmelted and then the melter tries to bring the steel back to normal conditions by adding more manganese or more silicon or both perhaps, occasionally making the steel too high in these elements to pass the specifications or too full of blow-holes to pass the shop inspection. Sometimes one of these same heats, thus spoiled, is one in which titanium is later added and the failure is charged to this element, which could have saved the heat had it been used in sufficiently large proportions of 1 per cent or more and in sufficient time.

One great advantage of the regular use of titanium alloy is that it re-

*Presented at the Pittsburg convention of the American Foundrymen's Association.

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Chmn Ball Game Com

J S SEAMAN
Chmn Finance Com.

ELIOT A KEBLER
Chmn Reception Com

JOS. T. SPEER, Chmn.
President, A. F. A.

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Chmn Convention Com

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## COMMITTEE IN CHARGE OF FOUNDRYMEN'S CONVENTION

**At Pittsburg, May 23-26**

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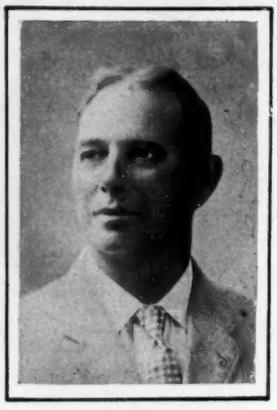

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**Officers of the American Foundrymen's Association and Associated Foundry Foremen**

moves those features of irregularity which have given steel a bad name for its unreliability in a number of directions. It would be out of the question to secure as uneven or irregular results in any mill when using titanium regularly as is frequently known to be the case without it. Heat after heat has been made with the addition of titanium in regular practice and when the chemical analysis of the mix has been practically uniform, the results have been equally good.

### Good Foundry Practice Essential.

In a recent trial of titanium alloy in a basic open-hearth, by one of the large steelmakers, it was found that in order to remove the last vestige of brittleness and of blow-holes the use of 1½ per cent of the alloy was necessary. This in turn made the steel so dense that it was unusually strong. It is not possible to remove all of the causes of poor castings by the addition of titanium nor with any alloy whatever. Good foundry practice is more essential in steel than in iron, because more harm is likely to result if the castings are not as good as they should be. When the mold is not properly made or baked; when the mixture is not properly estimated and prepared; when the melt is not looked after to prevent overheating, etc., it all comes back to the original statement that other things are necessary as well as the use of alloys, for good steelmaking. When we learn that in some mills a sinking head is cast which weighs considerably more that the casting itself and the latter in some instances weighs eight tons, then we see at once that foundry practice has given way to the sink head and it is a wonder the casting itself does not give way as well.

### Excessive Cost of Sink Heads.

Compare the cost of a nine-ton sinking head to make an eight-ton casting with the cost of titanium alloy in sufficient quantity to remove the blow-holes which the big sinking head removes and it figures out about as follows, with castings at 3½ cents per pound and scrap at 0.75 cent per pound:

| | | |
|---|---|---|
| Nine-ton head, 2,000 x 9 x 0.035 = | $630.00 | |
| Less scrap value, 2,000 x 9 x 0.0075 = | 135.00 | |
| | | $495.00 |
| Maximum head of 40 per cent by using titanium, 2,000 x 8 x 0.40 x 0.035 | $224.00 | |
| Cost of 1 per cent titanium alloy for eight-ton casting and 40 per cent head, 22,400 x 1.00 at 12½ cents | 28.00 | |
| | | $252.00 |
| Difference in favor of titanium | | $243.00 |

When we take into consideration the fact that so small a proportion as one-tenth of 1 per cent of titanium alloy makes a noticeable improvement in steel and that larger proportions up to 2 per cent add materially to the improvement, then it becomes clear that the small cost involved, from 25 cents as the minimum to $5.60 per gross ton of product as the probable maximum, is a factor which every steel manufacturer should consider.

### Titanium in Open-Hearth Steel.

The following proportions have been used regularly in a steel plant where only the best results are accepted and where the product is said to be equal to the best stamping steels made in this country:

Size of heat, 120,000 pounds.

| | Carbon. | Manganese. | Phosphorus. | Sulphur. |
|---|---|---|---|---|
| | Per cent. | Per cent. | Per cent. | Per cent. |
| Analysis.... | 0.10 | 0.33 | 0.007 | 0.019 |

Titanium alloy added in ladle, 250 pounds = 0.21 per cent, or 0.021 per cent titanium.
Aluminum added, 10 pounds = 0.01 per cent.
Elastic limit, 37,060 pounds per square inch after dead soft anneal.
Tensile strength, 44,920 pounds per square inch, after dead soft anneal.
Elongation in 2 inches, 40 per cent.
Elongation in 4 inches, 28 per cent.
Reduction of area, 56.4 per cent.
Fracture, silky.

In one of the most noted steel works in the world, steel castings are required of the following specifications:

Elastic limit, 45,000 pounds per square inch.
Tensile strength, 85,000 pounds per square inch.
Elongation after rupture, 12 per cent.
Contraction of area, 18 per cent.

These specifications have been met and the necessity for numerous heat treatments has been avoided by the use of eight pounds of titanium alloy per ton of metal added in ladle. No aluminum was used.

Regarding the use of titanium this concern has written as follows:

Comparing the results of the tests made upon specimens after the first anneal of the last 15 heats in which ferro-titanium was used, with those of the last 15 previous heats in which it was not used, it appears that the mean tensile strength was increased from 81,633 pounds per square inch to 91,533 pounds per square inch, that the mean elastic limit was increased from 47,233 pounds per square inch to 50,000 pounds per square inch, that the mean elongation was increased from 15.1 per cent to 19.2 per cent, and that the mean contraction of area was increased from 1.9 per cent to 24.3 per cent.

In a letter dated April 12, 1911, J. H. F. Dixon, general manager of the Keystone Steel Castings Co., Chester, Pa., makes the following comment on the use of titanium alloy in their steel castings:

The added cost of the production of our metal by the use of this alloy is so slight that we are prepared to furnish genuine crucible castings, titanium-treated, at the same schedule of prices which apply to our carbon steel. We strongly recommend the use of steel, so treated, for automobile work where the castings are subject to unusual shocks and where uniformity of material is absolutely essential.

## Book Review

**Composition and Heat Treatment of Steel,** by F. F. Lake; 246 6 x 9-inch pages; illustrated; published by the McGraw-Hill Book Co., and supplied by THE IRON TRADE REVIEW for $2.50.

This work treats of the various processes involved in making steel, from the reduction of ores in the blast furnace to the hardening, tempering and carbonizing of the finished product. The first chapter presents an outline of the process of making pig iron, and is illustrated by sectional and external views of blast and electric smelting furnaces. This is followed by a description of the Bessemer, open-hearth, crucible and electric processes of steelmaking, chapters being devoted to each. The section treating of "Ingredients of and Materials Used in Steel," comprises 47 pages and gives a short history and description of the chemical properties of the various elements used in the manufacture of the different grades of steel, and the effect they exert upon the alloy. Other chapters describe the various processes of working the steel into shape, the furnaces and fuels used in the heat treatment of the metal, and includes numerous illustrations of machines and furnaces that have been developed for this purpose. The book concludes with a description of the theory and methods of steel annealing, the microscopic examination of steel, its structural formation, and methods of tempering and carbonizing steel.

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The David Ranken Jr. School of Mechanical Trades, St. Louis, has issued its first annual catalog. This school is a philanthropic institution founded and endowed by David Ranken Jr., of St. Louis. Its object is to train boys and men for the mechanical or manual trades and occupations. All the instruction given is of a practical nature, the courses in the curriculum including carpentry, patternmaking, plumbing, painting and steam engineering.

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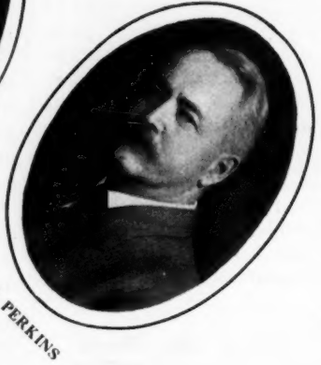

F. N. PERKINS

E. A. PRIDMORE

H. R. ATWATER

R. S. BUCH

## THE MEN BEHIND THE EXHIBIT

**Officers and Directors of the Foundry and Machine Exhibition Co.**

# Practice of the Open-Hearth Steel Foundry[1]

## A Discussion of the Melting, Molding and Core-making Problems—Economies of the Covering Core

*By R. A. Bull*

The manufacture of steel castings from the open-hearth furnace has been accompanied with such a remarkable progress in the last 15 years, and has reached such a commanding position in the foundry world today, that it provides a topic of very general interest, and one that should be fruitful in the matter of discussion. It is, obviously, impossible to cover the subject more than briefly in a paper such as this and I shall confine my remarks as nearly as possible to a cursory treatment of some of those questions of operation which are of particular interest to all foundries making open-hearth steel.

### Melting.

It seems hardly necessary to discuss furnace construction. However, by way of introduction, it will not be amiss to explain for the benefit of founders of other metals than steel, that the two types of open-hearth furnaces—acid and basic—are of the same construction, except for the material used as a bottom. The furnace is of the regenerative type, and has a rectangular shape, with a shallow bath, the fuel being introduced intermittently from each of the two ends or ports. Natural gas, artificial gas, fuel oil, or crude oil provides the fuel, and where oil is used it is atomized by compressed air or by steam or, sometimes, by both. Where the furnaces are sufficiently distant from the boilers to condense much of the steam, it is advisable to superheat the latter before it enters the burner. The dryer the air or steam, the better will be the atomization. It is not a difficult matter to make the furnace superheat its own steam by means of a coil set into the flue, either on the furnace or the stack side of the valve. When ordinary pipe is used for this purpose, valves should be provided at the inlet and outlet of by-passing through the coils, so that the supply line containing the wet steam can be depended on, should the coil burn out.

The roof of the furnace is, of course, arched. There are many differences of opinion concerning this seemingly simple feature, and these arise from the disastrous experiences had with some forms of roof. It is a serious matter to have the roof fall into a charged furnace, and this may be due to defective construction or careless melting. Some roofs are constructed with a sort of downwardly projecting baffle near the ports, to deflect the flame to the bath. This object is attained, I fear, at the expense of cutting-out the roof and causing it to cave. Certain roofs are sprung in both directions, horizontally and transversely. I favor the straight type of roof, that is, one having the same radii, without projections from port to port. Since the furnace is always hotter on the tapping side than on the charging side, due to loss of heat through the charging doors, causing the roof to burn out more quickly near the back wall, it has been found worth while to make the roof at this point 13 inches thick, tapering gradually to 9 inches, obtaining this graduation by special silica shapes. Of course, the radii of the inside of the roof are made identical, the difference being on the top or outside. Great care is exercised when lighting a new furnace, in properly loosening the tie rods for graduated and uniform expansion of the roof, to avoid buckling, and so ruining what may have been a perfectly constructed roof.

### Construction.

As with the roof, so with the checkers and the stack is it advisable to provide more generously for the foundry than for the mill, and all for the same reason, namely, because of the higher working temperature, generally speaking. With a properly designed roof, well constructed, with ample checkers and with a high stack of suitable diameter, given careful manipulation by the melters, and the use of first grade brick throughout, a basic stationary furnace fired with oil should turn out 450 heats for the foundry without more than the usual Saturday or Sunday repairs. The acid stationary furnace should make 600 heats. The gas-fired furnace of either type will not last so long, because it is not possible to so nicely control and direct the flame as with oil. The tilting furnace, naturally, suffers displacement of its brick by rolling it in tapping and its life is very short. It has some advantages over the stationary furnace, but these are not generally regarded as balancing the disadvantages.

Insufficient attention has heretofore been given by most foundrymen to proper atomization in the oil burner. There are various patented burners on the market, but those of proper proportions for open-hearth practice are quite few in number. It is, however, only by the use of considerable skill, the acquisition of much experience, and data compiled from carefully conducted tests, that a thoroughly satisfactory burner can be produced, except by mere chance. Probably, one reason for the partial neglect of this feature hitherto has been the difficulty of metering the oil consumed. I believe it to be less than two years ago when it was impossible to secure a meter that would register closer than 12 per cent of accuracy on fuel oil. Since that time meters have been put on the market guaranteed to register within a permissibly narrow limit, and this has undoubtedly stimulated the investigation of the most economical burner. And in connection with the proper atomizing of the oil, aside from the mechanical construction of the burner, I offer it as my belief that a recording thermometer is an excellent device for the oil pipe line. Furnacemen know that fuel or crude oil will not atomize well if either too hot or too cold, and the use of a recording pressure gage on the oil line and one on the air or steam line are wise investments. By such means experiments will show what temperature and pressures give best results, the readings will show any undesirable fluctuations and the causes for these can be easily remedied. An automatic recorder to register the reversing of the burners, which should take place at approximate intervals of 20 minutes when the furnace is charged, and 30 minutes when empty, prolongs the life of the furnace.

As to the differences in construction and operation between the acid and the basic furnace, these are more easily disposed of than are the relative advantages of the two practices. The acid bottom is made up of silica sand, while the basic furnace has a bottom of magnesite, or a mixture of magnsite and some basic slag. Additional sand is used for repairing acid bottoms, and magnesite or dolomite for filling up the holes that develop in the basic bottom. The acid furnace is not capable of the reduction of phosphorus and sulphur and, consequently, necessitates the use of pig iron and scrap of low content in these metalloids, for the conversion into

[1]Presented at the Pittsburg convention of the American Foundrymen's Association.

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steel of high grade. Carbon, silicon and manganese can be reduced easily in the acid furnace, and for the reason that its process is not such a refining one as the basic, its heats can be made more quickly and with less damage to the brickwork.

### Basic Furnace.

The basic furnace permits the use of charges containing high phosphorus and moderately high sulphur, for these elements as well as the three reducible in the acid furnace can be worked down to permissible percentages, for first grade steel. Naturally such refinement consumes more time and reduces the number of heats capable of being tapped without repairs to the furnace. This refining process oxidizes more metal than does the acid process, causing a higher melting loss, at the same time, charging the molten bath with more gases, which should be practically eliminated before casting. This, of course, calls for the use of proper deoxidizers, concerning the addition, of which much has been learned in the past few years. Melting losses in the basic furnace average close to 9 per cent, while those in acid practice are generally claimed not to exceed 6 per cent.

### Acid and Basic Castings Compared.

There is yet considerable difference of opinion as to the relative qualities of acid and basic steel castings, though not a few acid enthusiasts of yesterday are being converted into basic advocates of today. Concerning the relative economies of the two processes, it is largely a question of locality and the prices of delivered suitable raw materials. But for superior castings, which must be not only practically homogeneous, but capable of withstanding severe shocks and strains, I champion the basic process, in the face of contrary opinion held by a few eminent metallurgists and sustained by many steel founders in the eastern states. I do not believe that the views held by those who decry the basic furnace because of its difficulty in producing solid castings have been formulated with sufficient knowledge of what has been accomplished by basic steel makers in the past six or seven years. It should always be borne in mind that the superior refining possibilities of the basic furnace are clearly exemplified in the product and this means much to those whose need is for steel castings containing a minimum of the objectionable elements, and whose purse will not provide for the necessarily high price charged for crucible or electrically-smelted steel castings. Our basic melters are entitled to much credit for great recent advancements in this direction and they have been ably assisted by the manufacturers of various alloys. Let no one, however, so mislead himself as to accept without question, all of the extravagant claims made for such alloys.

It is, I find, not known to all acid steel founders, familiar with basic melting or to all consumers of steel castings and metallurgists, that there are numerous steel foundries that, for several years, have made it a practice not to pour the last part of the basic heat in castings intended for purposes calling for practically homogeneous metal and steel which will successfully withstand severe shocks and strains. There is an undesired increase of phosphorus and sulphur and a disappointing decrease in manganese and silicon in the last 3 per cent (approximately) of most heats which carry a normal thickness of basic slag in the ladle. These changes in the analyses are of sufficient degree to cause trouble if such metal be converted into castings such as were referred to previously. It is no uncommon sight to witness the pouring of this inferior metal, in steel foundries wishing to maintain a high reputation for the superiority of their product, in ingots or pigs, to be used only as are crop ends in the mill. The slag, while serving as a conserver of heat, is principally responsible for the deterioration of the metal lying just beneath it. Experiments have been made, but so far as I know, without complete success, at least in the plant with which the writer is associated, to dispense with the basic slag after tapping the furnace and to substitute for it some other covering which will prevent the chilling of the steel and at the same time not affect the elements in combination. The chief difficulty is found in mechanically removing the slag, which must be done with promptness and thoroughness in the face of decidedly awkward and physically unpleasant conditions. Notwithstanding such handicaps, the possible results are of sufficiently great importance and economic value to justify continued application of ingenious effort in this direction.

### Patternmaking.

I prefer not to leave the topic of melting without briefly advocating, for humanitarian and economic reasons, three eight-hour shifts on the open-hearth platform. I firmly believe man to be incapable of his most efficient physical and mental labor prolonged for 12 hours per day, and for seven days per week, in the face of such trying conditions as are those of a furnace man, especially during the hot months of the year.

The next natural topics for discussion will be the foundry and its sisters, the core room and pattern shop. Regarding the latter there is not much to discuss which is characteristic of open-hearth steel plants, and yet of common interest to all of these. I wish by no means to give the impression by this statement that the pattern department, in my opinion, is comparatively an unimportant member of the works' organization. Its function is not to be overestimated and goes far beyond the cheapest method of constructing patterns which can be used for making castings. The strength and type of patterns are regulated by the number of castings ordered and the most economical method of producing them. And since many open-hearth plants daily make castings varying in weight from a few pounds to several tons, on orders calling for one casting to several thousand, it can be readily appreciated that the variety of work necessitating diversity of methods, gives ample opportunity for the ingenuity of the pattern foreman, whose experience must be broad enough to adapt the construction of the pattern to the job, whether the material used be white pine, maple, red wood, mahogany, gray iron, brass, aluminum, or what not, and to intelligently make the proper shrinkage and warpage allowance, greatly varied as they are in steel work.

### Covering Core Pattern.

While dealing with the subject of patterns, I do not like to pass to the next one before suggesting to those whose work is of such a nature as to permit its extensive use, and who may be partially unaware of its adaptability, the enormous possibilities of the covering-core pattern. I think its value is greatest in the open-hearth foundry because of the increased difficulty there in preventing scabs and strains with large copes, in casting. Covering core is really a misnomer, but the term is used for want of a better one, and at least readily conveys its meaning to foundrymen, to whom the principle is not new. I do not believe any one, who has not seen for himself with what reduction to foundry cost this use of a copeless mold can be economically applied, can fully realize its advantages. Naturally, its usefulness is largely confined to designs with large area and open spaces between top members of small or moderate width, all without great variation from the same horizontal plane. I have in mind a certain intricate casting which occupied a floor space over- all of about 120 square feet and weighed only 3,300 pounds. It required one nine-hour shift and five hours of the succeeding shift for eight molders and five helpers, or equivalent of about 12½ molders and 7½ helpers to make one mold with cope and drag. The use of the covering core later for this same job permitted the finishing of two molds (and by the way, much better one, resulting in a lower piecework rate for chipping the

castings) by 12 molders and six helpers in one nine-hour shift. The piecework cost for labor in making the covering cores for one mold amounted to $1.80. As the cost of core rods, core sand, baking cores, etc., is more than offset by the cost of facing, gaggers, and such materials in the cope, the proportion in favor of the covering core in this case is as two to one. Additional advantages are the elimination of crane service for handling large, unwieldy copes, and the reduction of floor space required on the molding floor.

### Molding and Coremaking.

It is, of course, generally known that silica sand of about 97 per cent purity is the material required for both mold and core, in the case of the former being mechanically mixed with such ingredients as fire clay, molasses, glutrin, water, etc., and in the case of the latter, with the previously mentioned substances and flour, oil, dry core compounds, etc. Attempts have been made to produce permanent molds for steel castings, but with very little success, and the field for usefulness here seems to be exceedingly narrow. Unobstructed by corners or angles, cast steel will shrink ⅝ inch per foot and this excessive contraction is the apparently insurmountable barrier before the ready adoption of the mold which will maintain its form in shaking-out.

### Green Sand Molds.

Up to about 15 years ago it was not believed possible to pour steel in molds not thoroughly dried and secure castings much less porous than a sponge. The west was the pioneer in experimentation here, as in many other problems of the steel founder, and demonstrated this to be a fallacy. As a matter of fact, while a perfectly dry mold will produce a more homogeneous casting than will a green mold, the specific gravity of castings made in green sand, not skin-dried, is found by very careful experiment to be only 4.3 per cent less than that of steel castings poured in well baked molds. While it is always the desire of the customer and the ambition of the founder to secure castings of perfect homogeneity, and each knows that a well dried mold is necessary for such purpose, nevertheless there are many cases in which it is quite impossible to properly provide for natural contraction of the cooling casting without resort to green sand for mold or core. In such instances it is manifestly wise to sacrifice the 4 or 5 per cent of greater density by producing a casting free from shrinkage cracks, some of which are not always observable on the surface. For this reason the use of green sand in steel molding has its very important applications. Portable oil burners are successfully resorted to as skin dryers for molds not of convenient size and conformation for thorough oven baking.

### Preparation of Facing and Core Sands.

The preparation of the facing and core sands is all important and is mechanically performed by methods sufficiently well known to require no description here. The mixtures, however, deserve a few remarks. The character and amount of bonding material varies, necessarily, with the quality of the sand available and with the degree of thoroughness with which the mixing is done. It is usually found highly economical and eminently satisfactory in every way to use a large percentage of old sand in the facing and core mixtures, many foundries using 50 per cent of such old sand and some a larger amount, though I know of steel foundries where all of the old sand is consigned to the refuse cars, extravagantly, as I believe. However, the amount of old sand best to use depends somewhat on the nature of the work to be produced and the amount of fire clay, or other bonding materials necessary, varies as the percentage of old sand varies, since the latter carries clay or other bonds in greater proportion than does the ordinary silica sand as found in nature.

### Use of Lifting Magnet.

In large foundries an economical method of recovering and handling this black or old sand is by use of a lifting magnet and a grab bucket. The magnet is used to wash the floor, so to speak, and take from it the spills, gates, risers, etc., after which the clamshell bucket follows to pick up the sand a yard or two at a time, and dump it in the storage bin.

It is well to provide very generously in the way of sufficient dry pans or other mechanical mixers, to make possible, at all times, and in spite of occasional break-downs, the thorough mixing of the facing and core sand, so that suitable strength of each can be secured with the minimum amount of bonding material.

Since molding methods are in their essentials, practically the same for all metals, we will only give attention to certain of these methods, peculiar to open-hearth steel foundries. For bottom pouring, necessary for such foundries, it can be understood by those who have never had experience with the manufacture of steel, that the mold must be rammed very hard, to avoid straining and breaking out under the pressure of the stream from a large ladle. For the same reason, the flask must be very strong and rigid and the closing of the mold attended with every precaution against run-outs. Because the mold is rammed hard, reducing to a minimum the voids between the globules of sand, ample vents must be suitably placed to permit the escape of gases in pouring, and to satisfy the high shrinkage common to steel, risers or sink-heads of sufficient number and size are provided. These risers are sometimes kept molten for feeding purposes beyond their natural freezing point by the use of stirring rods, charcoal, or thermit.

In labor saving devices for making the mold itself, the jolt-ramming machine ranks high in the open-hearth foundry, and is being made more and more flexible in its applications to diversified work and peculiar conditions. Its operation is familiar to all foundrymen, and to those in the open-hearth field it appeals strongly because of its peculiar advantages here, where hard, uniform ramming is essential.

### Cores For Steel Castings.

Because of the severe pressure of the molten metal on the mold, cores of various kinds for the open-hearth steel foundry must be better reinforced with rods than those used for other metals, to avoid springing, and they must be more collapsible than those used in the gray iron foundry, because of the excessive shrinkage. For this purpose, sawdust, coke, cinders, etc., are frequently resorted to, and the dry core compounds are of great benefit, since they enable the preparation of core sand having the requisite bonding strength, at the same time making the core less refractory than does flour.

It is the customary practice to fire the core oven with coke, but careful and intelligent experimentation with an oil burner under the cores will, I think, convince many of those still using the coke fire that much speedier and somewhat more economical results are obtained by baking the cores over a fuel oil flame. Naturally, the relative economy depends to large extent on arbitrary conditions, such as the delivered price of each kind of fuel, the available storage facilities for each, and the available steam or air for atomizing. Moisture in the steam line is very easily eliminated by making the oven superheat its own steam by means of a coil of wrought iron pipe, laid on top of the arch of the fire box,

through which the steam by-passes before entering the burner.

The use of a cement briquette testing machine is found most convenient by founders purchasing flour, core compounds and binders in large quantities. This is a device which costs very little. With insignificant labor and loss of time, the proper use of such a machine will leave no foundryman in the dark as to the relative bonding strengths of various compounds and binders.

Providing for sufficiently free shrinkage to avoid rupture is perhaps one of the chief concerns of the modern open-hearth steel founder, making large castings or those of intricate design. Enough of interest might be said upon this topic to merit its receiving exclusive treatment in a paper such as this. Location of gate and of risers, pouring temperature, quality of facing and cores, position of flask bars, uniformity of section, nature and relative position of members of casting, runouts, excess of phosphorus and sulphur, over-oxidation, all of these causes and many others, some not yet fully known, have bearing on this question of contraction.

### Casting.

Pouring the metal into molds justly receives the closest attention. Aside from the waste and attendant unpleasantness due to leaky stoppers, which may be the result of the ladleman's carelessness, the use of defective materials, or the melter's poor judgment, there are found at times scrap castings as a result of clean, but unskillful pouring. Preliminary to tapping the furnace, the ladle is daubed over its brick lining and dried, usually with an oil flame, for about three-quarters of an hour. Then the stopper rod is adjusted, and the lever raised and lowered to see that the nozzle correctly seats the stopper head. If the metal, on entering the ladle, is not hot enough, or if the cold additions are thrown into the ladle too soon, a skull of half-frozen metal will form around the nozzle, preventing the seating of the stopper head and thereby a clean shut-off, until such skull has been melted and freed from the nozzle. If the metal is too hot, the nozzle is frequently first to suffer by cutting-out, and this usually results in a heavy per cent of spills. Should the ladleman permit the stopper to float, or not pinch the stopper tight against the nozzle, a small dribble may appear, and by soon cutting the nozzle, result in a most serious leak. Care must always be exercised not to raise the stopper too high on the first mold, or to close it too soon, after being first opened.

Cleaning and chipping steel castings do not offer any novelties to foundry methods in other metals, other than the increased difficulty of removing the tougher metal. The use of pneumatic chipping hammers, cutting-off saws, sand blasts, tumbling barrels, and similar equipment, depends largely on the character of work in each individual shop. The welding of minor defects in open-hearth steel castings when properly performed, is attended with good results and is permitted with reasonable limitations by most of the large consumers, such as the railroads and the United States government. Both the autogenous and the electric method have their respective adherents. My experience has been that the former is more suitable for very light sections, and the arc better for medium or heavy sections in cast steel. In the application of either method, ample heat must be produced for satisfactory work. Good welds cannot be expected with insufficient gas or amperes of current. Pre-heating and after-heating the castings, if of heavy or uniform section, tend to prevent the cooling strains from causing injury. Hammering the weld intermittently while under heat, checks the formation of slag and gives a closer union. On a tensile test one should get an average efficiency of 60 to 65 per cent of the ultimate strength of the natural cast steel. The elongation and reduction of area are considerably reduced. Analysis shows the metalloids to be almost entirely oxidized, leaving nearly pure iron in the weld, and thus explaining the loss in strength.

### Annealing.

The annealing of steel castings must be very carefully done, and attended with constant reference to a reliable pyrometer, to be of the slightest value. The generally accepted correct annealing temperature is about 800 degrees Cent. Should the casting be subjected to a temperature appreciably lower or higher than this figure, more damage than benefit accrues. Hence, the necessity for extreme nicety of operation in annealing castings lacking uniformity of section, to avoid overheating the lighter members and under-heating the heavier ones. The necessity for annealing at all should be governed largely by the composition of the steel, whose analysis may be such as to make of annealing a needless operation for ordinary work.

The loss in bad castings, of course, depends to no small degree on the severity of the inspection, and the class of work common to the shop. However, the ordinary open-hearth steel foundry, producing an average run of work and following a thorough and intelligent inspection system will, if my observations count for anything, have close to 4 per cent of scrap castings, if working molders and coremakers during daylight hours only, and 6 per cent if compelled to employ this labor on both day and night shifts. The cause for this difference is readily understood by any foundryman.

## New Catalogs

MANGANESE STEEL CASTINGS. — The Edgar Allen American Manganese Steel Co., Chicago, Ill., has issued a booklet which enumerates the different kinds of manganese steel castings made by that company at its Chicago Heights, Ill., and New Castle, Del., plants.

STOKERS.—The American Stoker Co., 11 Broadway, New York, has issued a booklet entitled, "Furnace Stoker Proofs." It contains a record of that company's business with a number of large firms, showing the number of repeat orders booked for stokers.

MOLDING MACHINES. — The Mumford Molding Machine Co., Plainfield, N. J., has issued a loose leaf catalog illustrating and describing its extensive line of molding machines, including jolt rammers, power squeezers, pneumatic vibrators, split pattern machines, etc.

STEEL AND SPRINGS. — The Harrow Spring Co., Kalamazoo, Mich., has commenced the publication of a monthly stock list of which the first number was issued in May. This concern operates a steel works, rolling mills and a spring works, and manufactures all kinds of springs, steel merchant shapes, alloy steels, special steels, etc.

ROCK DRILLS.—In a reecently issued pamphlet, the Ingersoll-Rand Co., 11 Broadway, New York, describes and illustrates its line of tappet rock drills. The distinctive characteristic claimed for these drills is the positive character of its valve movement. The working parts of the drill previous to assembling, are shown in a number of illustrations.

MANGANESE STEEL.—A booklet entitled, "Manganese Steel and Its Application to the Ceramic Industries," has been issued by the Edgar Allen American Manganese Steel Co., Chicago. It contains an address on this subject delivered by G. W. Kneisly, of the Edgar Allen company, at a meeting of the National Brick Manufacturers' Association of America.

ENGINEERING SPECIALTIES.—The William Powell Co., Cincinnati, has just issued catalog No. 10, a 328-page book, 5 x 7½ inches, bound in cloth. It is devoted to valves and other engineering specialties. In this book, the illustrations have been revised and renumbered throughout and a number of other changes have been made, including a new method of arranging the index of the figure numbers which facilitate the use of the catalog. At the end of the volume is gathered a large amount of information which is conveniently arranged. This includes tables on horsepower, belt contact, algebraic formulae and other data of interest to the steam enginer.

# The Use of the Lifting Magnet in Foundries*

## The Application of This Device to Service in Casting Plants for Handling Pig Iron, Scrap, Castings, etc.

*By H. F. Stratton*

In general a device becomes an economic necessity to an industry when its installation will yield a reasonably large return on the investment, and when the device has demonstrated, through several years of actual service, that it can be considered reliable and beyond the experimental stage. The word necessity is chosen advisedly, because with the existence of such a device some manager, more sagacious than the average, will make the installation, after which the insistent demands of competition will then compel the general adoption of this economic necessity.

An analysis of such figures as the speaker has been able to secure, relating to the tonnage and the cost of handling of the pig used by the foundries in this country seems to indicate that the lifting magnet is becoming an economic necessity to foundries producing a large proportion of the total foundry tonnage.

There appear to be three huge businesses which can profitably use lifting magnets for the transporting of iron and steel products.

First, the steel industry, with probably 10,000,000 tons annually which can be economically handled by the magnet, and in this industry the magnet found rapid and extensive use, with savings to the steel mills of probably close to $1,000,000 annually.

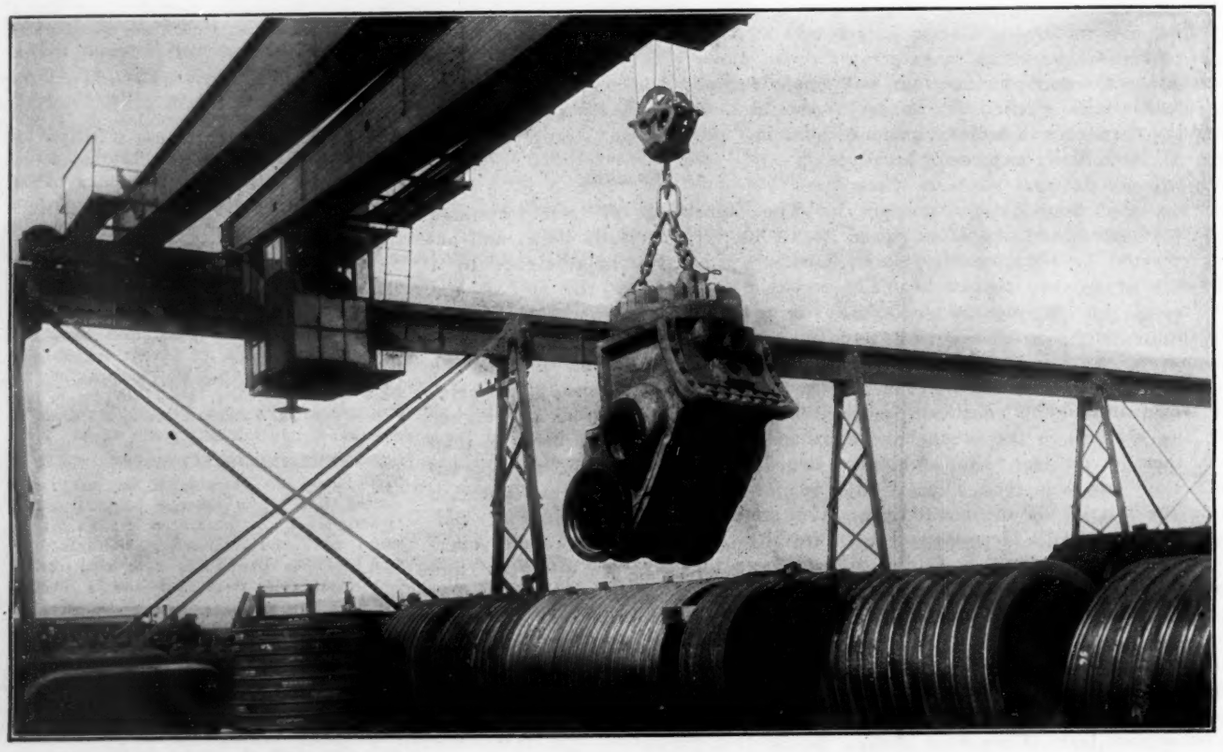
Second, the railroads have discovered that magnets are large money savers in the handling of their scrap material, and probably 100 lifting magnets are at present in use at the scrap docks operated by the various railroads throughout this country. In several cases the economies effected by the use of magnets, in handling railroad scrap, have proven to be so large and so obvious as to warrant the installation of very complete equipments, consisting of special cranes, several magnets, and a convenient and scientically arranged collection of bins, shears, etc.

Reference will be made later to the savings effected by railroads in the handling of their scrap material, since this will have a direct bearing on the cost of scrap-handling in foundries. For the present, the following quotation from a paper by F. D. Reed, assistant to the vice president of the Chicago, Rock Island & Pacific railroad, will give a summation of this matter:

> Sorting of scrap, the way we handle it here, can be done for from 4 to 7 cents per ton; in other words, we can handle scrap in and out with our facilities for from 10 to 12 cents per ton, including the sorting. Prior to May, 1909, at which time our crane and magnet were installed, when all scrap was handled by hand, the cost per ton in and out ranged from 30 to 35 cents per ton, which is about what it is costing any railroad today that is handling scrap by hand, or even with very good modern facilities for handling, and to keep it down to this figure it must have good and convenient scrap dock arrangements and efficient organization.

The third industry, which would appear to have opportunities to effect savings by the use of magnets, is the foundry. It has been estimated that

*Presented at the Pittsburg convention of the American Foundrymen's Association.



MAGNET LIFTING LOCOMOTIVE SADDLE CASTING WEIGHING 4,100 POUNDS

the foundries of this country melt annually 6,000,000 tons of pig iron and scrap, and although I have no definite knowledge of the relative proportions, it would seem reasonable to conclude that of this total about 1,000,000 to 2,000,000 tons is represented by scrap iron and steel.

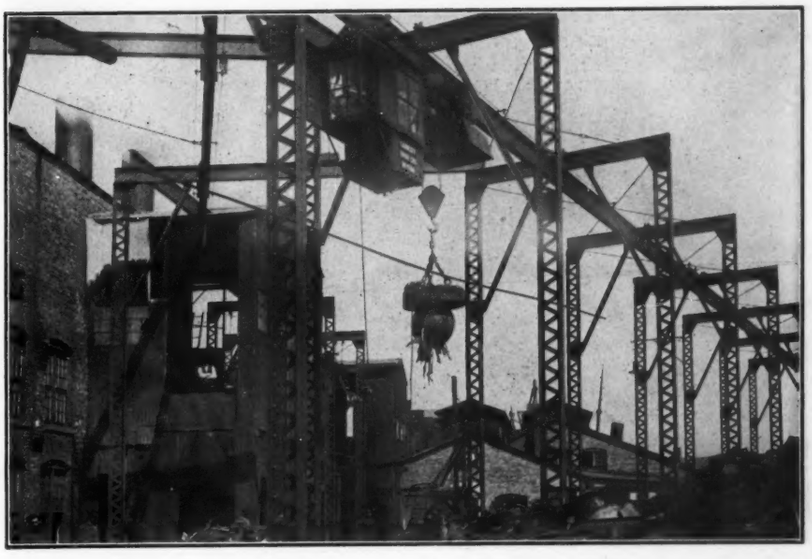
Of these three named industries in which the lifting magnet can apparently be used to economic advantage, the foundry has been by far the most reluctant to embrace or even to investigate the economies which are apparently open to it. The author trusts it will not be considered presumptuous if he makes the statement that a number of foundries are today not using magnets merely because of an apparent antipathy to departing from established customs and methods.

It is the author's desire to indicate in this paper—fairly and conservatively—the economic possibilities of magnets in foundries, and to outline the costs of installation and of operation of a suitable magnet equipment. This is done with the desire of placing before the foundry manager such figures that he will be enabled to determine what would be his cost of handling by means of a magnet, and assuming that he knows his present cost of handling by hand labor, to enable him to determine, by his own investigation, if the installation of a magnet equipment would be profitable in his individual case.

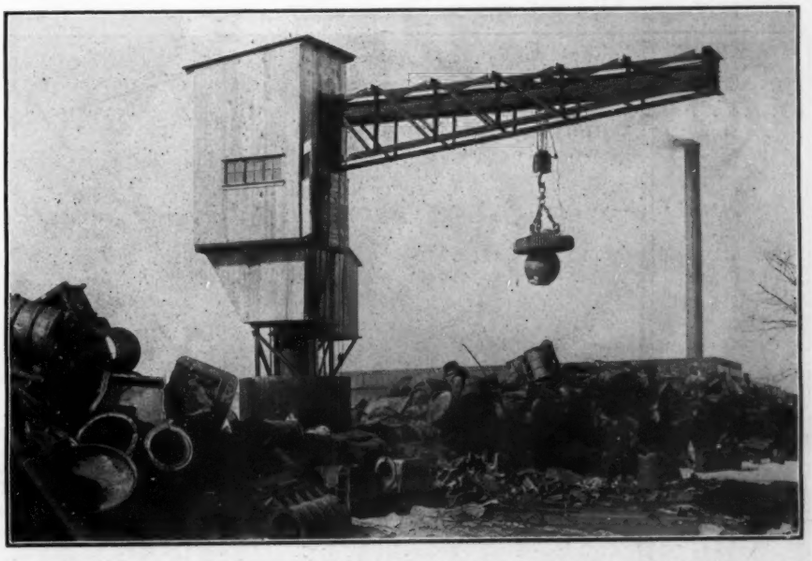
**Cost of Installation and Operation.**

An analysis of the costs can be best undertaken from the separate considerations of cost of installation and cost of operation. Later some statements will be made with reference to the severity of service which lifting magnets inevitably encounter, and for the present it is safe to assume that no man, in justice to his company, has the right to purchase any except a well built magnet. A magnet thoroughly capable of withstanding hard abuse costs about $1,300 per ton of lifting capacity of pig iron. Standard magnets are constructed in about four different sizes, and although this figure just named does not hold accurately for all sizes, yet it is a fairly close index to the selling price and is sufficiently accurate for purposes of estimate. It may be mentioned at this point that the approximate lifting capacities of these different sizes of magnets in service are, expressed in pounds of pig iron per lift, as follows: 800, 1,350, 1,950 and 2,400.

Of course some kind of a crane is necessary for handling a magnet, and if the foundry already has its yard equipped with either an overhead traveling crane or a locomotive crane, the installation of the lifting magnet becomes a simple and relatively inexpensive matter. If it be applied to an overhead crane, it is merely necessary to run leads from the crane to the magnet and to provide some simple mechanism for taking up the slack in these leads as the magnet is hoisted. If the magnet be applied to a locomotive crane, current can be furnished to the magnet either by suitable plug stations installed at various points in the yard, or an engine generator set can be put on the crane, the generator delivering current to the magnet and the engine taking steam from the boiler of the locomotive crane. This latter arrangement, while more expensive in first cost, is preferable in that it provides a flexible unit which is operative at any place which the locomotive crane can reach. A high grade, four-wheel, 10-ton locomotive crane, complete with an engine generator outfit, can be installed at an expense of about $5,500, and such a crane will handle a magnet at a boom radius of about 40 feet, thereby covering a large area even if the crane runs on only one track. Of course, by the use of parallel spurs a large area can be conveniently, cheaply and completely served by the locomotive crane. A locomotive crane is of such general use to a foundry that it is only fair to charge but a portion of its cost to the magnet. The locomotive crane can, for instance be used for loading and unload-



MAGNET OPERATED ON A MONO-RAIL SYSTEM

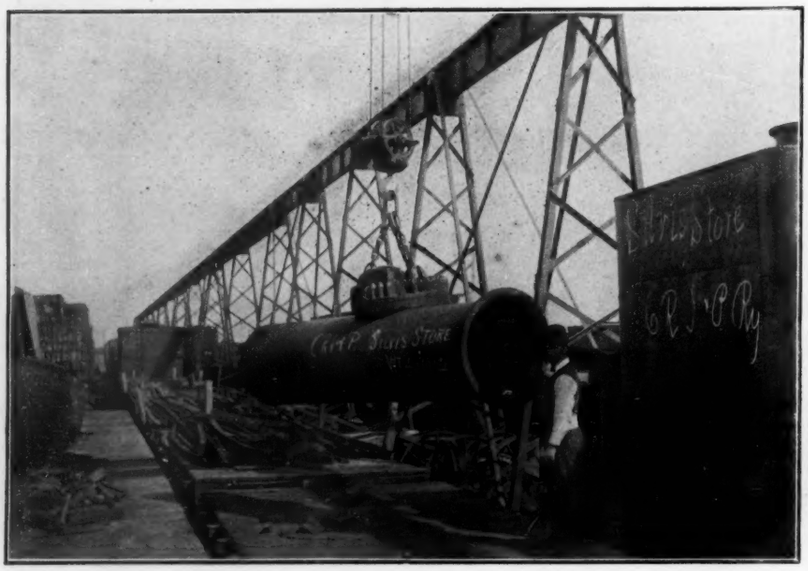


MAGNET HANDLING BALL FOR BREAKING LARGE CASTINGS AT THE BALDWIN LOCOMOTIVE WORKS

MAGNET ON LOCOMOTIVE CRANE HANDLING SCRAP

ing heavy castings and machinery, and for shunting freight cars. For about $1,000 extra it can be equipped with a two-line outfit and a bucket for unloading sand and coal. If we consider that $3,000 is a proper proportion of the locomotive crane cost to charge against the magnet, and if a magnet is selected of such size that it will have a lifting capacity of about 1,350 pounds of pig iron, the cost of the magnet installation then becomes about $3,900, or, in round figures, $4,000, installed and ready to operate.

The operating cost of a magnet consists of certain charges, including operator's wages, fuel and oil, which will exist only when the magnet is in operation, and depreciation charges on the equipment, which will not depart much annually from a fixed amount, whether the tonnage be sufficient to keep the equipment busy practically all the time or only an hour or two a day. It follows, then, that the operating cost, which is the sum of these two charges, will necessarily be lower per ton of material handled if the equipment can be kept in service the majority of the time. Most foundries, however, do not melt sufficient metal daily to require the services of the magnet more than two or three hours per day. A concrete case will be selected for the double purpose of indicating how similar estimates may be made to cover any particular foundry, and for pointing out a daily tonnage at which the installation of the magnet and crane appears to be an economic necessity. The assumption will be made that a foundry melts 35 tons of metal daily, 300 days in the year. All of this metal must, of course, be handled twice, that is, it must be unloaded from the car to piles and loaded from the piles to some kind of a wagon, on which it is carried to the cupola platform. For a foundry of this capacity the following figures apply:



MAGNET LIFTING A CAST IRON PIPE WEIGHING 4,310 POUNDS

**Charges Per Hour.**

| | |
|---|---|
| Operator's wages | $ .30 |
| Fuel (at $3 per ton and using ½ ton per 10 hours) | .15 |
| Oil, etc. | .03 |
| Total | $0.48 |

**Economies Effected by Magnet.**

A crane and a magnet of the size previously referred to, will conservatively handle 35 tons per hour, which will make a cost of 1.4 cents per ton. The annual depreciation on the $4,000 equipment at 12 per cent would be $480, and as 35 tons handled twice per day for 300 days represents 21,000 tons handled annually, the depreciation cost on this tonnage basis is 2.3 cents per ton. This brings the total cost of handling, including wages, fuel, oil and depreciation, up to 3.7 cents per ton. I have been informed that 10 cents per ton is a fair figure to assume for the cost of loading or unloading pig by hand, and on this basis the saving would be $1,323 annually, or 33 per cent on an investment of $4,000.

If the case of a larger foundry be cited, melting 100 tons per day for 300 days per year, and assuming in this case that metal is handled more cheaply at 9 cents per ton, by hand labor, the annual saving effected by the use of the magnet is $4,080 or over 100 per cent on the investment. It may be mentioned in the case of the smaller foundry that the time the magnet is in use daily would be about two hours, and in the case of the larger foundry, with the magnet selected, about six hours daily would be required. In this latter instance it would doubtless be more economical to install a magnet having a lifting capacity of about 1,950 pounds, instead of 1,350 pounds, which was the basis on which the estimates were made.

With these figures in mind, attention is directed to this conclusion: A foundry melting 35 tons of metal daily can install both a crane and a magnet, and expect a return upon the investment, after allowing all charges, of more than 30 per cent. If it happens that a foundry is already equipped with either an electric or

a locomotive crane, a magnet can then be installed on a very profitable basis when the tonnage to be handled is considerably less. For instance, if an assumption be made that a foundry melts 20 tons daily, and that a magnet be installed on an existing crane, the cost of the magnet being about $900, then the cost of handling per ton, including wages, fuel, oil and depreciation on the magnet, is about 2.3 cents, which would represent a saving in this foundry of about $924 each year, or over 100 per cent on the investment.

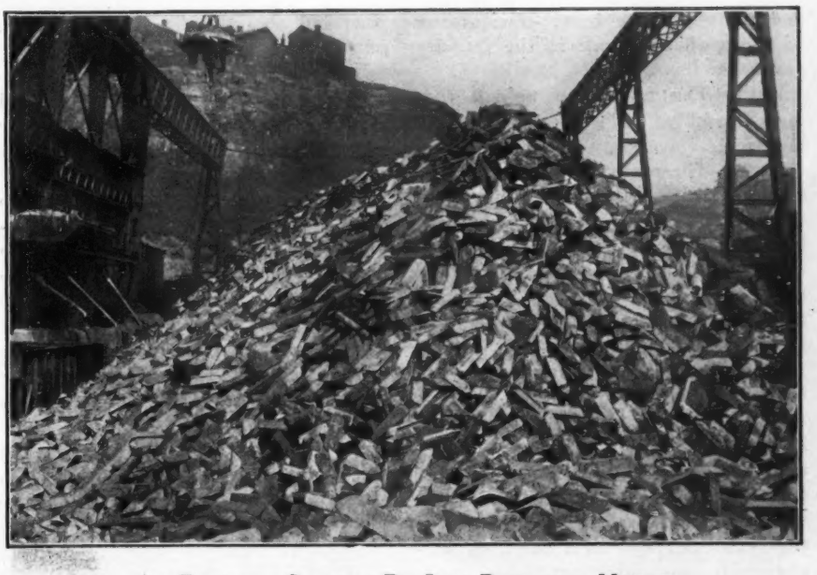
**Conservative Estimates.**

It is very earnestly hoped that these figures be not brushed aside with the assumption that they are theoretical and must be largely discounted. As a matter of fact, the costs of handling by a magnet are stated conservatively, and are being reduced in service daily. The figure of 10 cents per ton for handling pig by hand is an assumption on the speaker's part, but from information gained during six years' experience in the manufacture and sale of lifting magnets, it is believed that this figure is not at all at variance with the facts.

Handling scrap, in general, will be more expensive than handling pig iron, whether it be done by hand or by magnet, but the advantage in favor of the magnet is more marked in the case of scrap than in the case of pig. As previously stated, the railroads have carefully investigated the comparative cost of handling scrap and large castings by means of magnets and by hand labor, and the following information is therefore submitted as being pertinent to the question of scrap handling in foundry yards. N. A. Mears, of the L. S. & M. S. railroad, gives the following comparative figures:

| | Cost per ton. |
|---|---|
| Loading locomotive tires by hand | $0.17 |
| Loading locomotive tires by crane with chains | .08 |
| Loading locomotive tires by crane with magnet | .04 |
| Loading heavy castings by hand—almost impossible. | |
| Loading heavy castings by crane with chains | .20 |
| Loading heavy castings by crane with magnet | .03 |

Another gentleman identified with the railroads states that it costs, for an average of 100 cars, $7 per car to unload scrap by hand, and $2.83 per car to unload the same character of scrap by crane and a magnet. Mr. Reed, of the Chicago, Rock Island & Pacific, says he can unload unsorted scrap with a magnet at from 2 to 5 cents per ton, and sorted scrap at from ½ to 1½ cents per ton. When this work was done by hand labor the expense was about three times as much.



An Enormous Stock of Pig Iron Piled by a Magnet

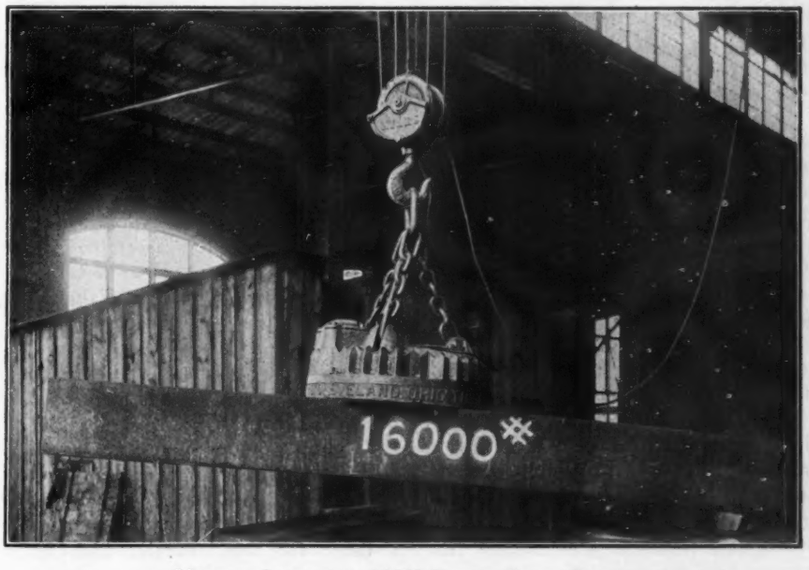
Exclusive of the economies already cited, certain other incidental advantages attend the use of a magnet, and in the summation these would probably be quite great, and any one of them might be very important in some instance. These incidental advantages, somewhat in the order of their importance, may be mentioned as follows:

First.—The elimination of labor trouble, this being particularly true where common laborers are apt to be very unreliable, as in the south, or where the demand for labor for harvesting the crops is extraordinary at certain times of the year, as in the west.

Second.—The ability of the lifting magnet to handle a drop ball for the breaking of castings too large to charge into the cupola. For this application the magnet not only serves to lift and release accurately, the ball, but also to pick up and transport the broken pieces of the casting. For this particular work, not only is the matter of economy to be considered, but also the question of increased safety for the operator.

Third.—The ability of a magnet to unload castings too heavy to handle by hand, and often of such shape as to be very inconveniently handled even by a crane with chains.

Fourth.—The ability to stock pig and scrap in piles higher than would be possible were hand labor employed,




Magnet Lifting a 16,000-Pound Steel Bloom

and thereby make more efficient use of the available space in the foundry yard.

Fifth.—The ability to unload cars more quickly, and thereby save demurrage.

Sixth.—The recovery of small pieces of iron in the bottom of freight cars, which can be magnetically swept up, but which would be neglected if the cars were unloaded by hand. This figure is considerable in the aggregate, and has been as high as several hundred pounds per car.

Seventh.—The convenient recovery of nails and iron shot in foundry sand. This is accomplished by slowly passing the magnet above the sand and as close to the sand as possible, and as the magnet passes over the successive portions of the ground, the small iron and steel particles, mechanically associated with the sand, will break through their confinement and leap to the magnet bottom, where they will be held until the magnet is de-energized.

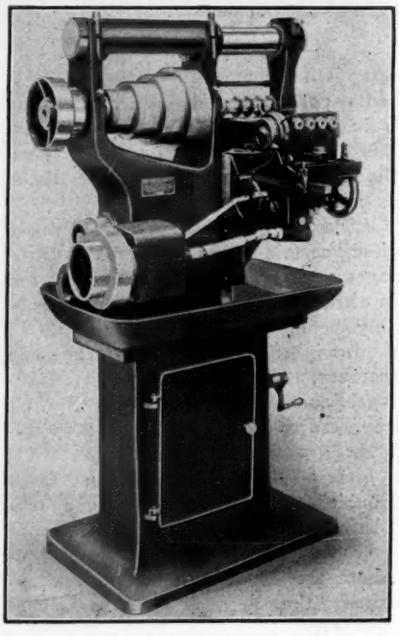
Eighth.—Independence of weather; this is particularly noticeable in the south, where the negro is temperamentally opposed to cold weather, and where difficulty is sometimes encountered in getting the common laborer to work out of doors during cold and inclement weather. The magnet, if anything, lifts more on a cold day than on a hot one, and will lift pig when covered by snow.

### Nature of Service.

Before discussing briefly the design and construction of magnets, it would probably be logical and pertinent to refer to the character of service which they encounter, and particularly to the extremely severe mechanical abuse to which they are subjected. For instance, a magnet, weighing about 1½ tons, is apt to be dropped, each time it is operated, onto a pile of unyielding pig, or scrap, a distance of from 5 to 15 feet. This necessarily means that the magnet is subjected to hammering, and a series of impacts so terrific that it is not comparable with the service given any other piece of electrical apparatus. Magnets are almost always handled by operators utterly ignorant of electrical equipment, and frequently their use has been regarded by laborers with open hostility, because of the fact that the magnets have made many jobs superfluous.

Bearing in mind, then, the extraordinary roughness with which lifting magnets are used, the necessity of sturdy design will be appreciated, and indeed it is true that many of the structural features are merely the response to the demands of hard service, and are, therefore, in the nature of natural evolution of design.

Briefly, the commercial lifting magnet of today consists of a disk-shaped steel casting, having in it an annular recess for the accommodation of the magnet coil, an energizing coil with many thousands of ampere turns to build up a magnetic field, suitable terminals for connecting the coil to the line, chains for the suspension of the magnet, and a non-magnetic bottom to hold the coil in its annular recess, to hermetically seal the bottom of the magnet, and to constitute a shield or a guard for the hammering to which the magnet bottom is subjected. The steel shell must be made of special steel, soft and carefully annealed, so that the magnetic field can be quickly built-up and quickly torn down. This



Automatic Fluting Machine

steel shell should be ribbed over its entire external surface, to allow for the rapid dissipation of the heat which is generated in the coil. Coils, in general, are built up of strap copper, insulated by asbestos and mica, and wound on brass or aluminum spools. After the coil is completely assembled, it is thoroughly impregnated at a temperature of about 300 degrees Fahr., giving the coil the best of insulation, and sealing it so as to exclude moisture.

An auxiliary device is the magnet control for quickly energizing or de-energizing the coil. For de-energizing the magnet, three different methods have been used: First, merely rupturing the circuit; second, opening the circuit, but allowing a discharge resistance for the inductive kick from the magnet, and third, an actual partial reversal of the current. This last method is the one now employed, and will cause the magnet to release its load several seconds more quickly than by any other known method.

The question of safety is frequently raised, and during the time when the magnet was being commercially introduced, its use was frequently combated on the score that it was dangerous to workmen. Of course, it cannot be denied that if a man is standing under a magnet that is carrying a load, and the circuit is interrupted, something is going to happen to that man. I maintain, however, that it is safer to use a magnet for the transportation of material than it is to use chains, and for several reasons:

First, the magnet is inherently a labor-saving device, and when it is used the number of laborers in its vicinity is reduced, and frequently the magnet entirely displaces ground labor.

Second, a laborer always looks upon a magnet with a high degree of suspicion, since there is nothing tangible to hold up the load, and he avoids getting under a load supported by a magnet more than he would under a load supported by chains; in other words, he uses more caution.

Third, the accidental opening of the magnet circuit probably does not occur as often as the breaking of chains supporting a load.

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## Automatic Fluting Machine

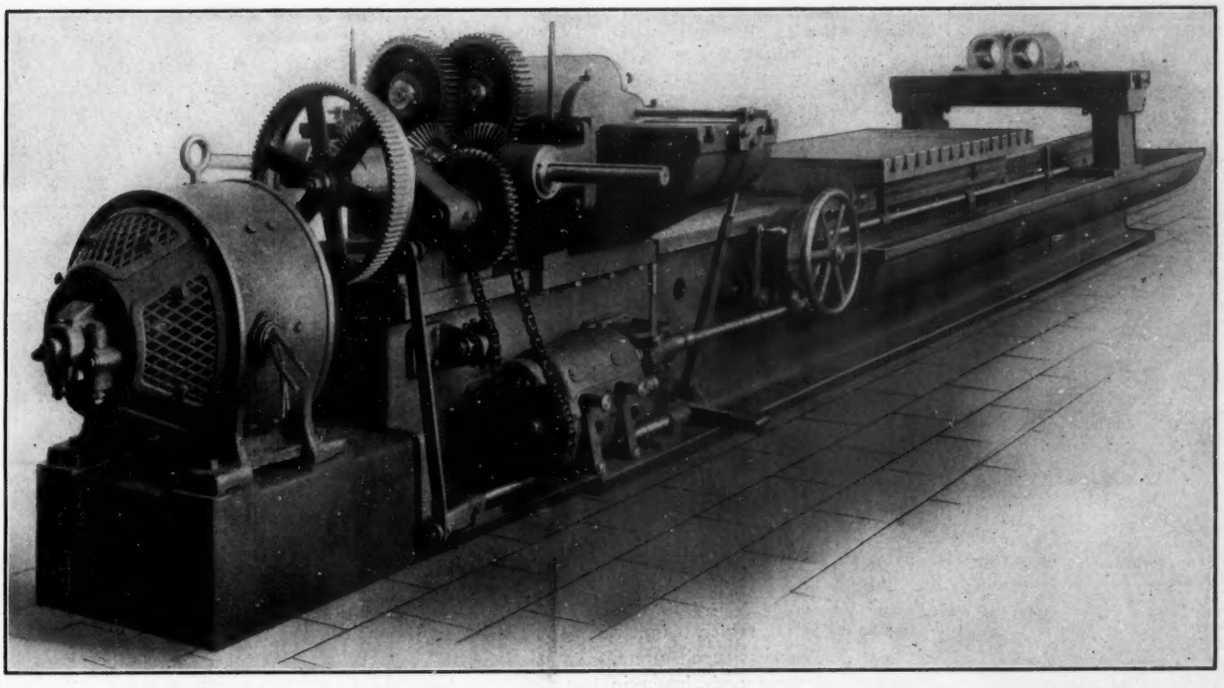
A new automatic fluting machine, built by the Bickford Machine Co., Greenfield, Mass., is shown in the accompanying illustration. This machine is designed for fluting taps or reamers, four at a time, in two sizes, the one shown being for work up to ½ inch diameter, while the larger size, which is back-geared, will handle work 1½ inches in diameter and is furnished with fixtures for squaring the shanks of taps. The action of this machine is entirely automatic after the work is placed between the centers, the carriage making the forward and return movements and the centers indexing at the proper time for the different flutes. The carriage returns at a speed five times as great as it advances, and is arranged to stop its travel, if by any chance the indexing should be improperly done, as well as at the completion of the work.

The return of the carriage is accomplished by three sets of compound gears by means of which, together with a sliding clutch, it is possible to reverse the direction of the ordinary telescope shaft and worm feed. The ratio of the gears for the return is 5 to 1 and a

special device is used which throws the sliding clutch from the forward to the reverse gear with no knocking or chance to pause during the change of direction.

The indexing of the centers is accomplished by a short spiral gear cut in each spindle and these mesh with a spirally fluted cross shaft which carries at one end an index collar with the necessary stops, etc., for determining its motions, and to which power is applied by means of a second collar mounted on the same shaft and connected by ratchet teeth to the index collar. As the carriage advances this second collar is revolved and by means of a pull spring and the ratchet teeth a tension is put on the index collar so that when the carriage returns a special device unlocks the index, the cross shaft is revolved, and turns the centers driving the work. The opposite end of this cross shaft carries a disc which has a number of flat places milled on its circumference to correspond with the number of flutes required. These flat places are arranged to just clear a stud set in a bar which operates the feed, and one side of the disc, not being milled off, will depress this stud and throw out the feed, or if the indexing is only partly done, a full part of the disc between the flat places will also stop the movement of the carriage.

Another feature of the feed mechanism is a disc carried at the end of the main feed shaft and on the circumference of which are stops to operate a small universal shaft which in turn shifts the clutch in the gear box. The cutters are supplied with oil from a tank in the base of the machine. A gear pump is used, being driven from the feed shaft, which will vary in speed according to the size of the work being done, and a cone drive is provided which will allow the pump to be kept at nearly a constant speed. The centers in the tail block are actuated by heavy coil springs and are operated by a curved lever, of special design, in such a way that it is not necessary for the operator to get his hands near the rotating cutters.



A Two-Spindle, Adjustable, Port Boring Machine

## Two-Spindle, Adjustable, Port Boring Machine

The two-spindle, adjustable, port boring machine shown in the accompanying illustration was especially built by the Beaman & Smith Co., Providence, R. I., for the purpose of boring the four valve ports in the cylinders of Corliss engines, two holes being bored simultaneously, after which the cylinder is reversed and the remaining two ports are bored. Holes from 3 to 9 inches in diameter and up to 6 feet long, may be bored at any distance from 8¾ to 37 inches between the centers of the holes. To obtain a high degree of accuracy in boring such long holes, the boring bars holding the tools are revolved in one position and the work is fed in either direction, thus eliminating any inaccuracy due to the springing of the boring bars. The feed mechanism may be reversed by the small lever at right of the feed box so that the roughing cut may be fed in one direction, new tools inserted and the finishing cut made as the table feeds back. The table has a quick, power traverse in either direction, which is run independently of the spindle drive by a small motor on the back of the bed. This permits the table to be run back quickly while the bars are not revolving, thus preventing the scoring of the finished bore by the tools. The quick traverse is controlled by a long lever below the spindle saddle, which operates the friction clutches.

The table has a work surface, 35 inches wide and 6 feet long, with a travel of 13 feet, 4 inches. It is operated by a screw of large diameter in a bronze nut, the thrust being taken by ball bearings and the mechanism is entirely protected from dirt and chips. The table feed is positive by means of gearing in a chain-driven feed box and is transmitted from the gear box to the feed screw through a worm and worm wheel, which has an automatic trip on the table in either direction. For the fine adjustments a hand wheel is provided. The spindles are driven by a 10 - horsepower motor, geared direct through a reduction from the motor to the spindles of 36 to 1.

The adjustment of the driving mechanism for different center speeds is provided for by transmitting the power

from the large drive gear to a shaft at right angles to the spindles. Each spindle head has a bracket attached and carries a bevel gear which slides on a shaft and in turn transmits the power from the shaft to the spindle gears. This method permits locating the spindles without altering the driving mechanism. Boring bars are fastened to the

FIG. 1—AUTOMATIC MACHINE FOR WELDING WIRE HOOPS, BUCKLES, RINGS, ETC.

spindles by four bolts and a driving key in each spindle. The outer support for the bars is constructed in the form of a bridge, independent of the table, so that it may pass under the support which rests on projecting ways, fastened to each side of the bed, and has an adjustment of 14 feet along the line of travel. A brake is provided on the large driving gear box which is operated by a foot lever on the side of the bed near the feed box. The weight of the machine, without motor, is approximately 24,000 pounds.

## Automatic Welders

A power-driven machine for electrically butt-welding wire, built by the Toledo Electric Welding Co., Cincinnati, is shown in Fig. 1. From 14 to 20 welds can be made per minute, depending on the size of the stock welded. The welder can handle round stock ranging in size from No. 1 to No. 16 gage.

The operator places the work between the clamping jaws and removes it after the weld is completed. All the other operations are performed automatically. Power is supplied through a belt and pulley at the right side of the machine, and is transmitted through a hand-operated friction clutch of large diameter. Cams on the driving shaft force the clamping jaws together and at the same time throw over the switch that turns on the welding current. When the metal is heated a second cam forces the two jaws together, completing the weld. A further revolution of the first cam shuts off the welding current and opens the clamping jaws, releasing the work, and sets the jaws to receive another piece. The transformer supplying the welding current is located in the lower part of the machine just below the clamping jaws. Power for operating the welder can be taken at 110 or 220 or any standard voltage up to 500 volts alternating, single phase current. Where only two or three-phase alternating current is available, the welder is connected across one phase of the circuit. The machine can be supplied for any frequency from 33 to 133 cycles, but is commonly built for 60 cycles. For welding, a current of from two to four volts is required. The high voltage line current is stepped down through the special transformer in the machine. The current consumption depends on the size of the work and the time consumed in making the weld. In welding no flux is used and only a slight burr is forced up where the ends unite.

All mechanical parts of the machine are built of cast iron, while the clamping jaws, conductors and transformers are built of copper. Knurled, adjusting screws are used to space the jaws to take work of various sizes. When set for one size of work no further change is necessary. An adjusting regulator switch and choke coils are used to vary the current for various sizes of work.

A power-driven, automatic, electric spot-welder, similar in operation to a power punch press, for welding sheet metal and shown in Fig. 2 is also built by this concern. The machine will make from 40 to 100 welds per minute depending on the thickness of the metal welded. Power is delivered through a reduction spur gear to a driving cam that is connected by a shaft and arm to the flat, upper, welding die. Both lower and upper die are made of copper and are water-cooled. The lower die is adjustable, sliding up and down to accommodate the different thicknesses of metal welded. The welder is operated by a foot pedal switch that is counterbalanced to stop the machine automatically if necessary. The welder transformer is located in the lower part of the case and a regulator for varying the current consumption for various sizes of metal is located at the side of the machine within the operator's reach. From 3 to 4 volts are used at the welding dies. Sheets up to and including ¼ inch can be welded on this machine. Tests show that electrically spot-welded joints are stronger than riveted joints.

## Ball-Bearing Disc Grinder

In the accompanying illustrations is shown a ball-bearing, 26-inch disc grinder equipped with an exhauster, manufactured by the Rowbottom Machine Co., Waterville, Conn. The spindle is mounted in ball bearings, the ball races being constantly supplied with lubricating grease through a cup over each bearing. Both tables are counterbalanced for making vertical adjustments and have a rocking motion across the face of the disc, or can be fastened in a stationary position. They also have an angular adjustment to the face of the disc. The table has a sliding motion to and from the disc, which is operated by a hand lever and controlled by an adjustable stop screw graduated in thousandths of an inch. This table is also provided with two T-slots for fastening angle plates or

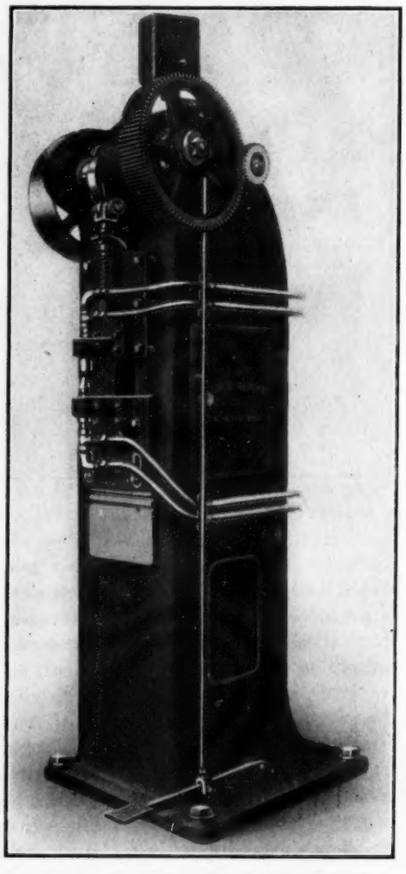


FIG. 2—POWER-DRIVEN, ELECTRIC SPOT-WELDER

fixtures. The other table has an adjustable gage for angular work on the horizontal plane. The grinder is equipped with a self-contained exhauster attached to the back of the machine, which carries off all sparks and dirt from the disc guards through the pedestal and discharges into a

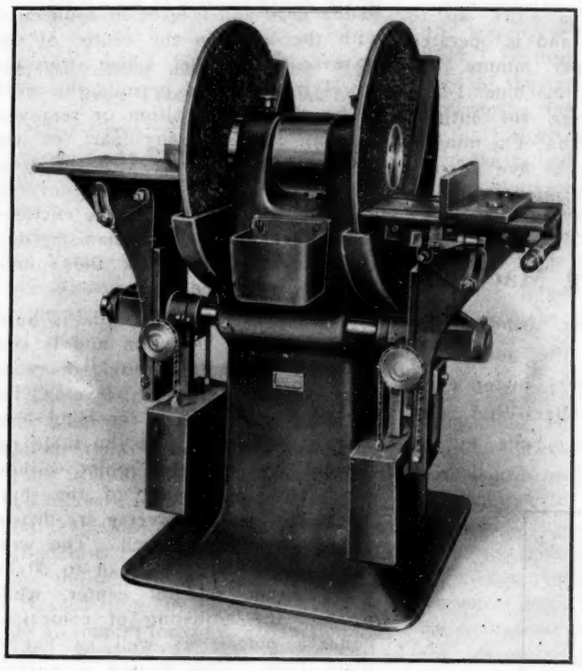


FIG. 1—BALL-BEARING DISC GRINDER

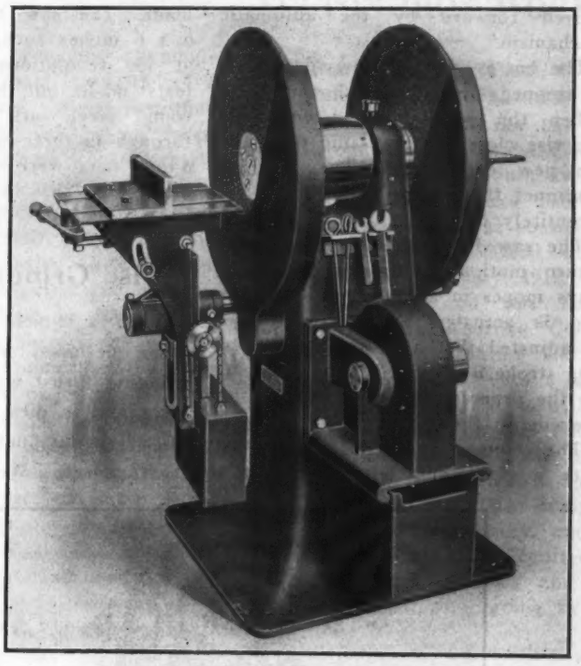


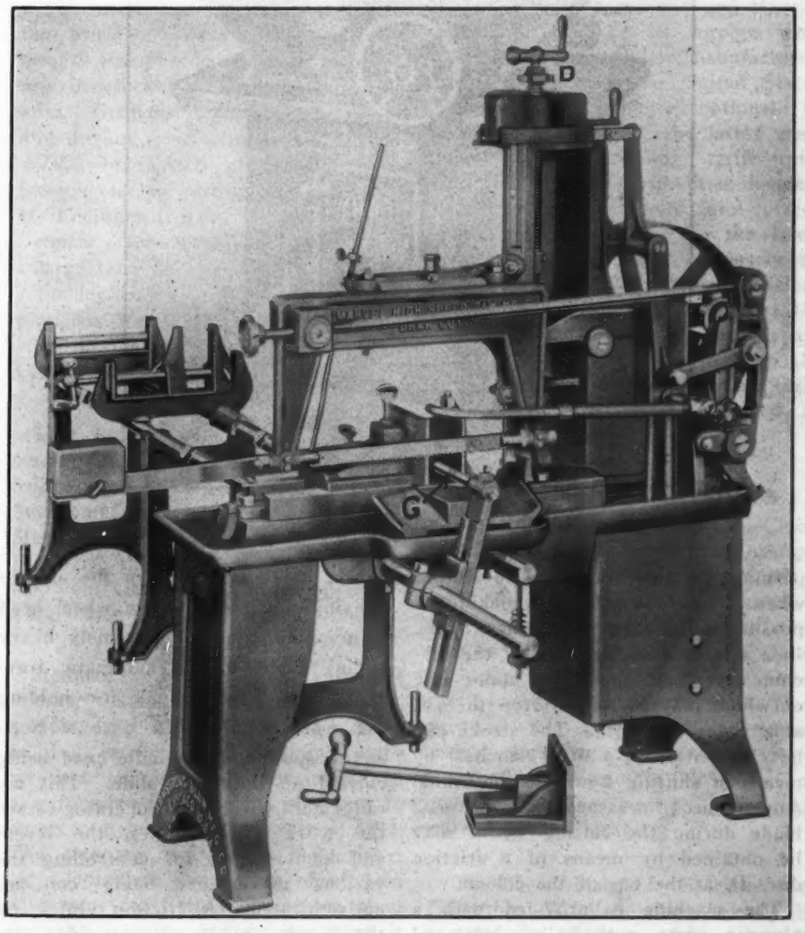
FIG. 2—REAR VIEW OF BALL-BEARING DISC GRINDER, SHOWING SELF-CONTAINED EXHAUSTER

removable water box underneath the exhauster, which can be cleaned from time to time. This self-contained exhauster is driven from the same countershaft as the grinder. The discs are 26 inches in diameter, the tables 17½ x 13 inches and the vertical adjustment is 7½ inches. The speed of the disc is 400 revolutions per minute and the weight of the machine complete, with countershaft, is 3,100 pounds.

## High Speed Hack Saw

A new, high-speed, manufacturing hack saw, built by the Armstrong-Blum Mfg. Co., Chicago, is shown in the accompanying illustration. This machine is designed for use in shops where a large number of duplicate pieces have to be cut. The saw automatically feeds the bar forward after each piece is cut off and starts the new cut automatically and without stopping. Each piece is exactly the same length. On account of its automatic features it is claimed that the saw mill will do as much work as eight ordinary hack saws, which require continual attendance.

The bar to be cut is clamped in a traveling vise shown behind the machine. The vise travels along a track consisting of two steel shafts. When the piece is cut off, the saw raises and at the same time the stationary vise fixed to the frame of the ma-




HIGH SPEED HACK SAW

chine opens, permitting the bar to be shoved forward by the automatic mechanism.

The bar is carried forward until it is stopped by a gage shown at G. When the saw starts down again the vise closes at the same time and the new cut starts. The machine continues this operation until the bar is entirely consumed.

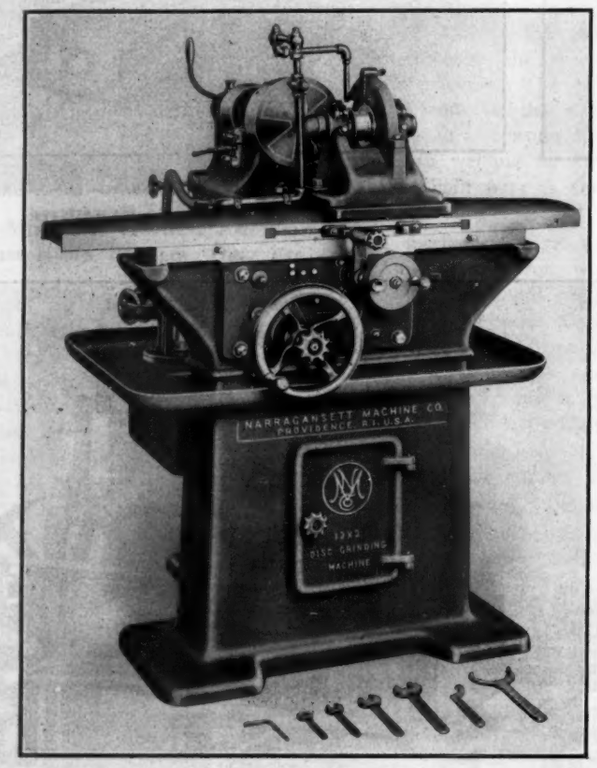
The saw is provided with a quick return motion. The saw frame always moves in a horizontal direction and is actuated by a crank lever so adjusted that a smooth, even cutting stroke is obtained. The saw cuts on the draw stroke and lifts free of the cut on the return.

The connecting rod is provided with a right and left screw which permits the saw frame to be shifted when in motion, thereby making it possible to use up the entire blade. In a slot in a saddle back of the machine are two dogs, the upper one of which may be set to stop the cut at any desired depth. The stroke can be changed from 4 to 6½ inches, by means of shifting a bolt in the crank. Any desired pressure on the saw blade during the cutting stroke may be obtained by means of a friction disc, *D*, at the top of the column.

The machine is provided with a plunger pump with ball valves and an overflow tank, which delivers a steady stream of lubricant to the saw blade. The saw takes stock up to 6 x 6 inches square and is operated at 130 revolutions per minute. In tests made on this machine 1-inch round steel bars were cut entirely through in three-fourths of a minute; 3-inch bars were cut in five minutes and 6-inch bars in 24 minutes.

## Disc Grinding Machine

A 12 x 2-inch disc grinding machine designed for the purpose of grinding thrust washers, piston rings, discs, saws, dies, collars and work of a similar nature, built by the Narragansett Machine Co., Providence, R. I., is shown in the accompanying illustration. The wheel head is mounted upon an extremely heavy sliding table, having automatic traverse. The other chuck for holding the work is threaded onto a horizontal spindle, the spindle head being carried on the cross slide. This arrangement permits the operator to see the work at all times, the levers and hand wheels for controlling the various movements being conveniently located. A friction clutch on the work spindle is provided for quickly stopping the chuck. It is controlled by the lever at the side of the head and is used in connection with the knob in the center of the traverse hand wheel, which stops the wheel traverse and permits the work to be placed in position or removed, without stopping any part of the countershaft. The ways of the cross slide and bed are always covered, and the top of the bed is enclosed to protect the feed mechanism, dust caps being provided for the spindle bearings and feed shafts.




A 12x2-Inch Disc Grinding Machine

The traverse of the table is automatic in either direction and is controlled by adjustable dogs, operating against the reversing lever. The spring plunger of the reversing lever can be withdrawn and the table run beyond the reversing point without losing the adjustment of the dogs. Three changes of traverse are provided for any work speed. The work head is graduated to read to 30 degrees either side of center, which permits the adjusting of conical or concave pieces, as well as flat or plain discs. This feature is particularly useful when grinding saws or milling cutters, as it permits of their being ground thinner at the center, to give the necessary side clearance. A taper dowel pin locates the head in position when set at zero. A screw and hand knob insures fine adjustment.

The feed mechanism is self-contained and is mounted on a plate fastened to the front of the machine. A knob at the center of the traverse hand wheel disengages the feed, leaving the hand wheel free to traverse the table by hand. The base is a T-section, supporting both the table and the work from the floor. It is fitted with shelves for small tools and wrenches and rests upon three feet to prevent any unevenness of the floor to influence the accuracy of the operation of the machine.

These machines are furnished either with or without pump and water connections. The pump consists of a centrifugal fan revolving in a horizontal plane. It is completely immersed in the tank, the water being returned to a sediment pan, in which the particles of emery and steel settle, thus preventing their being carried into the tank with the water. Traps are also provided which catch any oil that may be in the water and prevent its passage into the tank, The machine will take work up to 12 inches in diameter and 2 inches thick; emery wheels can be adjusted up to 8 inches in diameter and ½ inch thick with a 3-inch hole. The spindles have five work speeds and the table has three feeds.

## GERMANY'S ADVANCE

**In Exporting Discussed by British Iron Trade Association.**

That Germany for the first time has beaten Great Britain as an exporter of steel in 1910 was brought out at the annual meeting of the British Iron Trade Association held at Westminster Palace Hotel on May 12. While, heretofore, Great Britain has for some years occupied third place in total output, she has maintained easy pre-eminence as an exporter.

The president of the association, Sir Charles McLaren, Bart, K. C., called attention to the fact that Germany in 1910 had the largest percentage increase in world steel production, and that since 1908 she had increased production from 10¾ million tons to 13½ million, while Great Britain had increased only 800,000 tons. Germany has no sources for cheap production that Great Britain has not and yet the German has outstripped the British rate of increase. He could not help thinking that it might be very profitable to concentrate attention upon the question of production and sale by syndicate. For years he has favored amalgamation. Some such amalgamations have been very successful in certain departments of the trade, and in fact those departments were kept alive only by judicious combination, in some cases that have extended all over the world. England is quite as well situated for economical production as Germany or America; she has as good fuel, if not better; ores of equal quality, with cheap and easy access to the foreign ores necessary to supplement British deficiencies. In that respect British makers are equal to either of their competitors, including America. There is a sort of military precision in the distribution of German products, together with much better banking facilities. British banks still adhere to old fashioned methods, whereas the Germans have great financial institutions promoting industrial undertakings. In the past also Germany had been superior in technical education, but England is now forging ahead, with numerous institutions for increasing metallurgical knowledge and the aid of the local authorities, and their excellent facilities for technical work. The Association could do much more practical good by widening the scope of its work. Very little is known about actual cost of production or the method of operating those great foreign syndicates, and he hoped that some such inquiry would be undertaken the coming year.

H. J. Skelton, in seconding the adoption of the report, said it was indeed a noteworthy fact that for the first time in its history, Great Britain has fallen into the second place as a steel exporter to the world's markets. Hitherto Britons had been proud of the fact that in spite of the greater output, both of America and Germany, Great Britain was the largest exporter in volume. Where is the fault to be found? An eminent speaker a short time ago referred to the great difficulty of getting first class directors of iron and steel companies. He had noticed that himself, and there was also a tendency in British iron and steel works and boards of directors to expect too much from the general manager and the managing director. The manager was not only expected to be general administrator of the works, but also to be responsible for the commercial policy. That system did not obtain in Germany, where the two departments are quite distinct. The Germans beat the Englishmen in the largeness of their plans; they always laid their plans as if they believed they had a big future and were able to capture the world's markets. He was sorry also to see the narrow and niggardly way in which Englishmen regarded salaries. Germans pay far larger salaries and do not mind a man earning even £2,000 or £3,000 per annum if he brought in a corresponding business. If Englishmen mean to overtake the German precision they must altogether enlarge their ideas.

Stanley Baldwin, M. P., was elected president for the ensuing year and a vote of thanks was accorded to Sir Charles McLaren for his services.

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**Last Span Placed.**—Following the placing of the last span of the new bridge across the Ohio river between Sewickley and Coraopolis, Pa., on May 16, the Fort Pitt Bridge Co., Pittsburg, entertained 75 engineers and contractors at a luncheon at the Park Place hotel, Sewickley.

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Stedman's Foundry & Machine Works, manufacturer of crushing, grinding and mining machinery, Aurora, Ind., advises that, although plans are not yet definitely formulated, a new foundry and machine shop are to be erected during the summer of 1911. The company will be in the market for a complete installation of modern equipment for both the machine shop and the foundry and advises that it will be glad to receive information of value regarding its selection.

## FULTON IRON WORKS

**Will Start on a New Plant, to be Completed Next February.**

The Fulton Iron Works has purchased ground on the Wabash tracks between Etzel and Plymouth avenues, in St. Louis, and announces that work will be started as soon as possible on a new plant to cost $300,000, and to be completed by February, 1912. The site cost $35,000, and was bought from the Wabash Railroad Co. It contains 6½ acres, fronting 400 feet on the railroad tracks, with a depth varying from 500 to 700 feet, lying between the factory of the Wagner Electric Co. and the new plant under construction by the Columbia Incandescent Lamp Co. The company makes sugar mill machinery, and 75 per cent of its output is exported to the Orient, South America and the West Indies, most of it going by the way of New York.

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## Foreign Tariff Work of Bureau of Manufactures

The bureau of manufactures of the department of commerce and labor is planning to make its foreign work more directly helpful to manufacturers and exporters of the United States. It possesses some exceptional facilities for supplying the latest exact information concerning tariff rates and the customs formalities incident to the entry of goods into foreign countries. In addition to the latest official customs tariffs of nearly all foreign countries, customs decisions and other official publications to the number of a thousand a month are regularly read and filed to keep the tariffs fully up to date. The tariff publications are being extended as rapidly as possible.

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## Sales Office Changes

The National-Acme Mfg. Co., Cleveland, announces the following changes in its sales department: A. W. Hopkins, purchasing agent and office manager, has been appointed sales manager of the product department; E. C. Woolgar, formerly western sales manager, has been appointed sales manager of the machinery department, with headquarters at Cleveland; R. J. Preston succeeds Mr. Woolgar as manager of the western office and warehouse at Chicago.

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The Sheet Metal & Specialty Co., Follansbee, W. Va., which recently let contract for addition, advises that the building has been completed and will be used as a store room.

## DYNAMITE OUTRAGES

**Strongly Denounced by National Association of Manufacturers.**

Employers of labor have become greatly aroused by the numerous dynamite outrages that have occurred throughout the country in recent years and by the accusations of responsibility recently laid against those connected with a labor organization for the destruction of the Los Angeles *Times* building. A decisive stand for remedial legislation covering the sale of and handling of this explosive, was taken by the National Association of Manufacturers at its recent annual convention in New York. The outcropping of class feeling in the utterances of so-called labor leaders in connection with the Los Angeles case, was also greatly deplored and on this subject the Association adopted a set of pointed resolutions. In an effort to more strictly regulate the sale or handling of dynamite, and the carrying of bombs, time clocks or other infernal machines, manifestly not intended for legitimate industrial use, the Association also adopted strong resolutions.

An appeal was made to the federal authorities at the closing session for an investigation by the department of justice of conditions in the structural iron and steel trades in order to insure the enforcement of law for the protection of life and property and for the dissolution of any organzations which would be found to have been terrorizing such employers.

In the election of officers, John Kirby Jr., was re-elected president, and F. H. Stillman again chosen treasurer. The following constitute the board of directors for 1911 and 1912: J. G. Battelle, Ohio; D. A. Tompkins, North Carolina; Ludwig Nissen, New York; E. L. Langworthy, Pennsylvania; H. S. Chamberlain, Tennessee; Daniel Simonds, Massachusetts; R. S. Hamilton, Rhode Island; C. M. Jarvis, Connecticut; C. S. Brantingham, Illinois; C. C. Hanch, Indiana; G. T. Coppins, Massachusetts; John Trix, Michigan; F. C. Schwedtman, Missouri; Enos Paullin, New Jersey; G. H. Stillwell, New York; G. D. Selby, Ohio; D. C. Ripley, Pennsylvania; H. E. Miles, Wisconsin.

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Frank B. Ward, for several years in charge of Manning, Maxwell & Moore's Cleveland office, and afterward manager of Pittsburg and Cleveland offices of Niles-Bement-Pond Co., has opened an office at 1203 Machesney building, Pittsburg, as representative of Henry Pels & Co., New York, manufacturers of punching and shearing machines with unbreakable steel plate frames, also of the Nazel Engineering & Machine Works, Philadelphia, manufacturer of Beche patent pneumatic forge hammers; H. B. Underwood & Co., Edwin Harrington, Son & Co., Philadelphia, and others.

## Tabor Mfg. Co. Planning for New Plant

The Tabor Mfg. Co., Philadelphia, referring to its recently noted incorporation, advises that this is simply a transfer of its New Jersey charter to a Pennsylvania charter, in order that the Tabor Mfg. Co. may own real estate in the state of Pennsylvania. This was made necessary because of its purchase of 5½ acres on the Chestnut Hill branch of the Pennsylvania railroad, on which it will erect a new plant. Dodge, Day & Zimmerman, who are the engineers, are completing the plans. The output of the new plant will be the same as heretofore, viz.: Molding machines, Tabor-Newbold saws, Tabor universal tool grinders, Tabor-Newbold milling cutters, and apparatus for the care and maintenance of belting. The Tabor company has not gone thoroughly into the question of new equipment required, but will need some new machinery.

## Amendment Proposed for Liability Law

The employers' liability commission of New York state, in its final report to the state legislature, recommends the adoption of a constitutional amendment which will meet the objections that caused the liability law passed at last year's session to be declared unconstitutional by the court of appeals. The amendment proposed is as follows:

The legislature may impose such conditions on any contracts of employment as shall be designed to protect the health or promote the safety or well-being of any of the parties thereto, or the public, or to make provision for the payment of compensation with or without the right of trial by jury and with or without regard to fault, to employes injured by accidents of employment, or to persons dependent upon them, either by employers, or by employers and employes or otherwise, in such manner as the legislature may prescribe and in the exercise of the powers herein conferred the legislature shall not be limited by Article 1, Section 18, of the constitution.

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Sterling Steel Foundry Co., Pittsburg, has increased its capital stock from $100,000 to $250,000.

## JONES PATENTS

**Leased to John M. Longyear and Others—The Step Process.**

At a recent meeting of the Jones Steel Process Co., held in Duluth, and the John T. Jones holding company, held in Chicago, it was voted to lease the use of patents of the Jones step process furnace to H. L. Higginson and John M. Longyear, co-partners, of Boston, Mass.; to John C. McGreevey, Louis L. Loeb, and H. J. Grannis, trustees, of Duluth, Minn.; and to Fred C. Harris, Richard Schell and others of Duluth.

The contract with Messrs. Higginson and Longyear grants the privilege of erecting and operating furnaces similar to the one in Iron Mountain, and it is understood to be the policy of the lessees to use the process in the treatment of low grade ores. The contract with Messrs. McGreevey, Loeb and Grannis grants the right to employ the patents in the treatment of low grade ores on the Vermillion range. To Messrs. Harris, Schell, and their associates, is granted a lease to use the furnace for the treatment of blast furnace flue dust. Mr. Harris is superintendent of the Zenith Furnace Co. at Duluth.

## Buys Chemical Works

The Antrim Iron Co. has purchased the works at Mancelona, Mich., of the Antrim Chemical Co., which have been operating for 20 years and which were owned by the late Joseph Berry, of Detroit, and associates.

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**May Meet in Cleveland**—An effort will be made to have the American Society of Mechanical Engineers hold its summer meeting next year in Cleveland. The invitation will probably be extended at the meeting of the association to be held in Pittsburg May 30 to June 2.

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The Skinner Engine Co., Erie, Pa., manufacturer of automobile engines, which recently purchased additional property, is now erecting a foundry, which will have about three times the capacity of its present foundry. The company will continue to make castings for its own use entirely, the present foundry not being large enough to supply the demand.

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Domestic copper exports for the week ending May 18 were 6,692 tons, an increase of 1,402 tons; from May 1 to May 18, 16,702 tons, an increase of 4,581 tons; Jan. 1 to May 18, 116,617, an increase of 19,534 tons.

# IRON AND STEEL SECURITIES

The New York stock market developed considerable activity the early part of the week, and prices showed an upward tendency on a favorable interpretation being given the Standard Oil decision by both financial and speculative interests.

The market, Monday, was one of the dullest of the year, sales reaching 146,900 shares; grain and cotton were slightly lower; in a decision rendered after the close of the market, the United States supreme court upheld the lower court, and declared the Standard Oil Co. a combination in restraint of trade, decreeing its dissolution within six months. The market opened strong, Tuesday, and continued to advance all day, closing at the highest; sales aggregated 1,002,000 shares, the largest for any day this year; the House appointed a committee to investigate the Steel Corporation; popular subscriptions were invited to an issue of $50,000,000 3 per cent government bonds. Prices opened strong and higher on Wednesday, the market broadening to include many inactive stocks, and the close was slightly below the best; the wheat market was firm and lower. Continued activity was shown Thursday, many stocks advancing to the highest price of the year; the Bank of England rate was unchanged; wheat declined, but cotton reached the highest price of the year. Sales on the New York exchange fell off Friday, and while in the early part of the session prices were firm, yet the market closed at small net losses; wheat closed lower. While the market was dull Saturday, the tone was firm, especially in copper stocks.

| | Closing Quo. May 20 | Changes in week | Annual Meeting date 1911. | Stock Outstanding | Basis | Dividend Last Dividend | Dividend Date Last Div. Pay. |
|---|---|---|---|---|---|---|---|
| Allis-Chalmers | 8 | + 5/8 | | $19,820,000 | | | |
| Allis-Chalmers, pr | 30 | +2 | Nov. 2 | 16,150,000 | 7 cum. | 1¾ Q. | Feb., 1904 |
| American Can | 11¾ | — 1/8 | Feb. 1 | 41,233,300 | | 1¾ Q. | |
| American Can, pr | 86⅛ | + 1/8 | | 41,233,300 | 7 cum. | 1¾ Q. | July, 1911 |
| Am. Car & Fdy | 55⅞ | +2⅞ | June 29 | 30,000,000 | | ½ Q. | Apr., 1911 |
| Am. Car & Fdy., pr | 119 | +1½ | | 30,000,000 | n. c. | 1¾ Q. | Apr., 1911 |
| American Loc | 42½ | +4⅞ | Oct. 17 | 25,000,000 | 5 | 1¼ Q. | Aug., 1908 |
| American Loc., pr | 107 | + ¾ | | 25,000,000 | 7 cum. | 1¾ Q. | Apr., 1911 |
| American Ship | 68⅜ | —3⅜ | Oct. 11 | 7,600,000 | 4 | 2 Q. *** | June, 1911 |
| American Ship, pr | 111 | ..... | | 7,900,000 | 7 cum. | 1¾ Q. | Apr., 1911 |
| Am. Steel Foundries | 44½ | +3½ | Dec. 7 | 17,184,000 | | 1 Q. | May 1911 |
| Barney & Smith | 20 | ..... | June 6 | 2,000,000 | 4 | 1 Q. | Dec., 1907 |
| Barney & Smith, pr | 87 | ..... | | 2,500,000 | 8 cum. | 2 Q. | Mar., 1911 |
| Bethlehem Steel | 33¾ | +1¾ | April 4 | 14,862,000 | | ..... | ..... |
| Bethlehem Steel, pr | 63½ | +2¼ | | 14,908,000 | 7 n. c. | ¾ Q. | Feb., 1907 |
| Cambria Steel | 46 | + ⅝ | Mar. 21 | 45,000,000 | 5 | 1¼ Q. | May, 1911 |
| Cambria Iron | 45 | + ¼ | | 8,468,000* | 4 | 2 S. A. | Apr., 1911 |
| Chicago Pneumatic Tool | 52½ | +3 | Feb. 20 | 6,485,800 | 4 | 1 Q. | Apr., 1911 |
| Colorado Fuel | 33¾ | +2½ | Oct. 16 | 34,235,500 | | 1¾ Q. | Apr., 1902 |
| Crucible Steel | 135⅛ | + ⅜ | Oct. 18 | 24,578,400 | | 3½. | ..... |
| Crucible Steel, pr | 81⅞ | +1⅜ | | 24,463,500 | 7 cum. | 1¾ Q. | Mar., 1911 |
| Empire Steel | 5 | ..... | Feb. 22 | 1,254,770 | | ..... | ..... |
| Empire Steel, pr | 50 | ..... | | 2,500,000 | 6 cum. | 2 S. A. | Jan., 1911 |
| Fay & Egan | 70 | ..... | Feb. 21 | 1,000,000 | 6 cum. | 3 S. A. | Feb., 1909 |
| Fay & Egan, pr | 110 | ..... | | 1,000,000 | 7 cum. | 1¾ Q. | Feb., 1911 |
| General Electric | 160⅛ | +3⅜ | May 9 | 65,179,600 | 8 | 2 Q. | July, 1911 |
| Harbison-Walker | 41 | ..... | Jan. 16 | 18,000,000 | | ½ Q. | June, 1911 |
| Harbison-Walker, pr | 96 | ..... | | 9,600,000 | 6 cum. | 1½ Q. | Apr., 1911 |
| International Pump | 40⅝ | +1⅝ | Dec. 12 | 17,762,500 | | 1 Q. | Nov., 1910 |
| International Pump, pr | 88⅞ | + ⅞ | | 11,350,000 | 6 cum. | 1½ Q. | May, 1911 |
| Lackawanna Steel | 44 | ..... | Mar. 8 | 34,978,000 | | ..... | ..... |
| Lake Sup. Corp | 29¼ | +1¼ | Oct. 4 | 40,000,000 | | ..... | ..... |
| New York Air Brake | 74½ | +6 | Mar. 8 | 10,000,000 | 5 | 1½ Q. | Apr., 1911 |
| Niles-Bement-Pond | 94 | ..... | Feb. 8 | 8,500,000 | 6 | 1½ Q. | June, 1911 |
| Niles-Bement-Pond, pr | 104 | ..... | | 2,000,000 | 6 cum. | 1½ Q. | May, 1911 |
| Otis Elevator Co | 68 | ..... | Mar. 20 | 6,375,000 | 3 | 2 S. A. | Apr., 1911 |
| Otis Elevator Co., pr | 99¾ | ..... | | 6,310,000 | 6 n. c. | 1½ Q. | Apr., 1911 |
| Pa. Steel | 60 | ..... | May 8 | 10,750,000 | | ..... | ..... |
| Pa. Steel, pr | 106¼ | + ¼ | | 16,500,000 | 7 n. c. | 3½ S. A. | May, 1911 |
| Pittsburg Coal Co | 20⅝ | — ⅛ | Feb. 10 | 28,104,600 | | ..... | ..... |
| Pittsburg Coal Co., pr | 80¼ | +1⅜ | | 27,071,800 | 7 cum. | 1¼ Q. | Apr., 1911 |
| Pressed Steel Car | 35½ | +3 | Feb. 15 | 12,500,000 | | 1 Q. | Aug., 1904 |
| Pressed Steel Car, pr | 101 | ..... | | 12,500,000 | 7 n. c. | 1¾ Q. | May, 1911 |
| Pullman | 162 | +2 | Nov. 8 | 120,000,000 | 8 | 2 Q. | May, 1911 |
| Railway Stl. Spring | 34¼ | +1¾ | Mar. 2 | 13,500,000 | 2 | 1 S. A. | Oct., 1908 |
| Railway Stl. Spring, pr | 101½ | +1 | | 13,500,000 | 7 cum. | 1¾ Q. | June, 1911 |
| Rep. Iron & Steel | 31½ | +1⅝ | Oct. 18 | 27,191,000 | | ..... | ..... |
| Rep. Iron & Steel, pr | 96 | +1½ | | 25,000,000 | 7 cum. | 1¾ Q. | July, 1911 |
| Sloss-Sheffield | 52½ | +3½ | Mar. 15 | 10,000,000 | 5 | 1¼ Q. | Sept., 1910 |
| Sloss-Sheffield, pr | 112 | ..... | | 6,700,000 | 7 n. c. | 1¾ Q. | Apr., 1911 |
| U. S. Pipe & Fdy. Co | 17½ | +1¼ | June 28 | 12,106,300 | 2 | 1 Q. | Dec., 1910 |
| U. S. Pipe & Fdy. Co., pr | 58⅜ | +3⅛ | | 12,106,300 | 7 n. c. | 1¼ Q. | June, 1911 |
| U. S. Steel | 80⅜ | +4¾ | April 17 | 508,302,500 | 5 | 1¼ Q. | June, 1911 |
| U. S. Steel, pr | 120 | +1⅛ | | 360,281,100 | 7 cum. | 1¾ Q. | May, 1911 |
| U. S. Steel, 5s | 106⅛ | ..... | | 463,798,000 | 5 | ..... | ..... |
| Va. Iron, Coal & Coke | 62 | +2 | Sept. 19 | 9,073,680 | | 5. † | Oct., 1907 |
| Westinghouse Electric | 73¾ | +5¾ | July 26 | 3,998,700* | | 3½ Q. ** | Apr., 1911 |
| Westinghouse Air Brake | 149 | ..... | Oct. 3 | 13,750,000* | | 5 Q. ‡ | Apr., 1911 |

Par value of shares, $100, except those starred (*), $50.
**Includes 1¾ per cent on back dividends.
***Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Includes 2½ regular, 1½ extra and 1 special.

Call money ranged from 2½ to 2 per cent; time money reached the highest price at the close of the week, due to an increased demand. The actual figures of clearing house banks showed surplus increased $2,175,675; loans decreased $1,227,500; deposits increased $562,900, and the ratio of reserve 28.4, compared with 28.25 the week previous. Non-member banks and trust companies report loans increased $26,726,000; net deposits increased $29,062,200, and the percentage of reserve 17.7, compared with 17.6 the week previous. Commercial failures for the week were 253, compared with 279 the week previous, and 212 the corresponding week last year. Bank clearings for the week showed an increase of 7 per cent over the previous week, and 8.4 over a year ago. The fortnightly railway statistics showed an insignificant increase of 272 cars, the total surplus of idle cars now standing at 187,278. Shares were dealt in to the number of 3,634,600, compared with 1,084,200 the preceding week, and 1,689,600 the corresponding week last year. Bonds, exclusive of government bonds were sold to the amount of $18,619,000, compared with $15,153,000 the preceding week, and $7,199,000 the corresponding week last year.

### Copper Stocks.

**New York.** — Amalgamated Copper closed 67⅜, a net gain of 4⅞.

**Boston.** — Butte Coalition closed 19½, a net gain of 2½; Calumet & Arizona closed 51¾, a gain of 2¼; Calumet & Hecla closed 473, a net gain of 15; North Butte Mining closed 31¾, a net gain of 3¾; Quincy Mining closed 70½, a net gain of 2½.

### Financial Notes.

The Harbison-Walker Refractories Co. has declared the usual quarterly dividend of one-half of 1 per cent on common stock, payable June 1.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

| | |
|---|---|
| April, 1910 | 5,793 |
| May | 5,827 |
| June | 5,842 |
| July | 5,864 |
| August | 5,875 |
| September | 5,895 |
| October | 5,955 |
| November | 5,993 |
| December | 6,026 |
| January, 1911 | 6,058 |
| February | 6,072 |
| March | 6,091 |
| April | 7,008 |

May 25, 1911

## Iron Mill Wages and Competition

While no formal statements have been made, there is every reason to believe that the iron mills of the central west which employ members of the Amalgamated Association and the Sons of Vulcan will demand a reduction in the scales for the new year beginning July 1 next, on the ground that selling prices are lower and trade conditions less satisfactory than when the expiring scale was adopted.

The question may be asked why a demand for a lower wage scale should be based upon lower selling prices for the finished product, when the whole wage scale is a sliding one, with rates of wages advancing and declining as the average realized price of bar iron advances and declines.

There are several reasons. In the first place, while the wage scale is a sliding one, the amounts by which it slides, for given changes in the price of bar iron, are only a relatively small fraction of those changes. Puddling, for instance, changes by 12½ cents per gross ton for a change of $1 per net ton in the selling price of bar iron, which means, allowing for waste, a variation in the puddling rate only about one-eighth as much as the variation in selling prices. Finishing wages, of course, fluctuate also, but as a rule the total of all tonnage wages does not fluctuate more than one-fourth as much as the selling prices. Obviously the workmen should receive only a fair fraction of the advance in prices, and so when prices decline the adjustment might be held to be adequate, but the scale settlement of last year was made at a time when iron bars had been bringing more than 1.45 cents, and regard was had chiefly for that fact. The latest examination showed an average on the basis of 1.25 cents, $4 per ton less, while the sliding wage scale in force recognizes this only by a reduction of 50 cents per gross ton for puddling, and by smaller reductions in finishing rates, the total being less than $1, so that the mills receive $4 less for their product, and save in wages less than $1. If wages and selling prices were proportioned to each other for the base rates in the scale, which are nominally 1 cent a pound for bar iron, the situation might be regarded as satisfactory, but recent settlements have been on a basis which gave the mills only a narrow margin when selling prices were much higher.

Another reason why the sliding wage scale is inadequate is that it is based solely upon the selling prices of bar iron, taking no account of the cost of raw materials. It chances that bar iron is a highly fluctuating commodity, readily declining in times of light demand and advancing as rapidly in times of heavy demand. Steel prices do not fluctuate to a like extent by any means. The selling prices of scrap, the chief raw material of the iron mill, do not fluctuate altogether in proportion to selling prices of bar iron, because large quantities of scrap are used by the steel industry. While iron bars have declined $4 a ton since last summer's scale agreement, scrap has declined considerably less.

It is to be recalled that the last settlement involved practically the restoration of the 1907-8 scale for puddling and finishing. That was a very high scale, and its restoration a year ago was due rather to the scarcity of puddlers than to the iron mills experiencing a profitable business. They were, however, better engaged than they are now, present conditions not being such as to make the scarcity of men important. There may not be enough skilled men to operate the entire iron mill capacity of the country, but the tonnage of orders is so much less than the capacity that the feature is not likely to be found of importance.

## Increase in By-Product Coking

The completion this year of the Woodward and Tennessee company by-product coking plants in Alabama makes the first Koppers ovens to be product coking in the south. The Woodward plant of 60 ovens and the Tennessee company plant of 280 ovens makes the first Koppers ovens to be built in Alabama, the state having had Semet-Solvay ovens for nearly 10 years, as in October, 1898, the Tennessee company put in operation a battery of 120 ovens of this type, at Ensley, and a second battery of the same number and type in March, 1902, while in February, 1906, the Central Iron & Coal Co. put in operation 40 Semet-Solvay ovens. With the new ovens just completed the state will have 620 ovens of the Semet-Solvay and Koppers types. Based upon actual realizations in the past, these ovens should have an output of fully a million tons of coke a year. Sta-

tistics of coke production in Alabama in 1910 are not yet available, but in three preceding years, 1906, 1907 and 1909, the state produced more than 3,000,000 tons of coke by all processes, but never reached 3,100,000 tons. In 1910, the production of pig iron was considerably greater than in any previous year, and if coke production were in proportion to pig iron production the state's coke production was in the neighborhood of 3,500,000 tons, from which it may be inferred that the state has reached a point where it is likely to make one-third of its coke by the by-product process. In 1909 the state produced 3,085,824 tons of coke, of which 533,903 tons, or 17.4 per cent, was by-product.

The south particularly needs the economies promised by the retort or by-product system, for the reason that it has always been handicapped in coke making by labor conditions. While the values of coke as reported to the Geological Survey are not compiled according to a uniform system, the showing still has some value, and the reports always indicate a considerable higher value for coke in Alabama than for coke in Pennsylvania, while it is common knowledge in the trade that the market price of coke is usually considerably higher at Alabama than at Connellsville ovens. As the coke consumption in iron making is somewhat higher in the south than in the territory tributary to Lake Superior ores, on account of differences in the ores, there is the greater incentive for the most approved coke-making methods to be used in Alabama.

It may be recalled that years ago when by-product coking was urged upon American iron and coke manufacturers, one objection raised was that any large output of the by-products would depreciate their value, so that the profits shown on paper might not be realized. There was no such experience in 1909, when 16 per cent of the coke was by-product coke, and there is no prospect of such experience. The gas obtained by the simple retort process is of value wherever coke is likely to be made. The heavy by-products, tar and ammonia, are in good demand, while on account of freights it is well that their production should be spread over the different coke-making districts.

## Industrial Legislation in Congress

During the last six months, a large number of state legislatures have been discussing and passing laws aimed to govern the relations of master and servant. Some good has resulted from the discussion, for, although few workable laws have resulted, a widespread interest has been awakened in the minds of both the employer and the employe. No doubt the employe has been the more active in stirring up the agitation, as he has been forced to realize that under the present methods of adjusting claims for sickness or injuries, he usually comes out with a very small sum to pay his bills after disposing of the expenses of his attorney, court and other costs, but employers are now deeply interested and are doing their utmost to solve the perplexing problems.

While the various state legislatures have been active, it is of importance to note what the last session of congress did in the matter of general industrial legislation. Although a large majority of the 40,000 bills introduced were private measures, several hundred of the public measures affected industrial relations in a variety of ways and proposed to amend, materially modify or repeal existing laws on the subject.

Early in the last session, the so-called Moon injunction bill was practically abandoned, although the regulation and issuance of injunctions was raised later during the consideration of this bill for the codification of the laws relating to the federal judiciary. Far reaching changes were proposed in the jurisdiction of the circuit courts. The issuance of injunctions was gone over thoroughly and six separate amendments were offered as substitutes for the existing laws respecting injunctions. After exhaustive consideration, none of the amendments was passed, although the senate passed measures of similar tendency, while three general amendments limiting the protection provided by the federal courts passed the house. No bill passed both houses of congress.

During the discussion of the eight-hour bills, it was clearly demonstrated that the adoption of an eight-hour day would entail an enormous burden upon private and public employment. According to the secretary of the navy, the eight-hour conditions that have been tried out in the construction of vessels for the navy have increased the cost of the construction of a battleship in private yards 21½ per cent, while the government has been forced to higher costs when constructing the vessels in its own yards.

The discussion on employers' liability and workmen's compensation bills the past winter in 15 or more state legislatures, brought out the fact that the consensus of opinion among all intelligent and progressive men who have studied the subject is that the adoption of a plan which in the essentials will be alike in all the states is highly desirable. A commission has been appointed by congress to work with the commissions of the several states in investigating the subject of workmen's compensation. Although congress can, of course, legislate for only the District of Columbia and the territories, any action taken by congress would have a far reaching effect upon the activities of the various states where the general plan would likely be modeled after that adopted by the national law making body.

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Notices have been posted at the plants of the H. C. Frick Coke Co., stating that firemen, pumpers, compressor, fan and dynamo men will be required to work but six days a week. About 500 men are affected. The new policy will become effective at once.

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Official reports issued by the Westinghouse Machine Co., Pittsburg, show that the business booked in April not only exceeded that of any single month this year but showed a gain of 10 per cent over the corresponding period of 1910.

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Commercial Electric Motor Mfg. Co., Inc., Chicago, advises that it has increased its capital stock to $50,000 in order to make additional plant improvements as well as to build its own factory in the near future.

# Machine Tool Builders on Trade Problems

## Non-Cancellation Clause Now Formally Established in Sales Contracts—Strong Appeal for Merchant Marine

Assembled in one of the best and most successful meetings in the history of the Association, 100 or more machine tool builders deliberated and acted upon various questions pertaining to this industry at the ninth semi-annual convention of the National Machine Tool Builders' Association, held at the Marlborough-Blenheim, Atlantic City, May 18 and 19.

The program of the convention was of a high order, as the papers embraced subjects of much immediate importance to the machine tool manufacturers and the discussions were full and spirited. On probably no other score was more satisfaction displayed at the convention than in the official announcement that a non-cancellation clause has now become formally established in the sale contracts of builders and dealers, thus abating the custom of annulment of orders whch was becoming prominent in various directions and thereby adding to the stability of the machine tool industry.

Following routine business in connection with the opening of the convention, reports of standing committees were given attention at Thursday morning's session. C. L. Taylor, of the Taylor & Fenn Co., Hartford, Conn., chairman of the patent committee, reported that efforts made for the establishment of a special United States court to consider patents exclusively have not been successful. The committee was continued in power.

### Non-Cancellation in Effect.

Much progress has been made by the incorporation in sale contracts of the non-cancellation clause approved by the Association, according to the final report of the committee on the cancellation of orders, presented by C. Wood Walter, of the Cincinnati Milling Machine Co., Cincinnati. Mr. Wood reviewed the various steps that had preceded this accomplishment following the original proposal at the Rochester convention in May, 1910, and the adoption of a suitable clause at the New York convention last October. This clause, which has been approved by the National Supply and Machinery Dealers' Association and is now being followed by them practically unanimously, is as follows: "Note that all our proposals, quotations and acceptances of orders are being made with the mutual understanding that orders are not subject to cancellation, provided shipment is made within the time specified." In concluding this report, Mr. Wood said:

Our secretary reports that the replies to postal cards mailed to our membership last February indicated at that time that 84 members were making use of this clause. While some members failed to reply, yet it is apparent that a small percentage of our membership is at this time not making use of the clause. This may have occurred through the fact that many of our members do not sell or quote the consumer direct. However, notwithstanding this fact, it is urged that all members incorporate this clause in their literature and correspondence, placing same on their letter heads, so as to add moral effect to the dealers' effort to hold the buyer to the legitimate obligation he assumes when he places an order for machine tools. It is very essential that manufacturers and dealers alike uniformly make use of this clause and persistently enforce its terms if we are to bring about a better custom of trade and abolish the cancellation privilege with its attendant evils, so readily admitted by all. We want to make it disreputable as well as illegal to cancel an order except for failure on the part of the seller to fulfill the conditions of the sale. Remember—custom is stronger than law—especially a bad custom. Unless we give notice through the universal and uniform use of this clause, we cannot expect to correct or limit the custom of cancellation privilege.

### Urge Ship Subsidy.

An eloquent address urging the enactment of some form of ship subsidy which would effect the upbuilding of the American merchant marine from its present disgraceful condition was delivered by Geo. J. Burns, of the Chandler Planer Co., Ayer, Mass., who gave the report of the delegates of the association to the Merchant Marine Congress. Mr. Burns said that the public had just heard the announcement of the courts inflicting heavy judgment upon a large corporation for violation of the anti-trust laws, yet as a nation, we are in the grasp of one of the closest monopolies that has ever existed—that of transportation. Mr. Burns says that 90 per cent of ocean shipping is in the hands of a foreign combine which is grossly discriminating against us, but it is a serious problem whether our courts have any jurisdiction in the matter. Either through coercion or co-operation, the railroads of this country are acting in concert with this shipping trust; for example, steel products can be shipped from Pittsburg to Japan at a less rate than from Seattle to Japan and be delivered by the same boat. Mr. Burns said that the violation of the anti-trust laws by the Standard Oil Co. is not to be compared with the violation of the transportation trust. Years ago American products were shipped in American vessels; today England has more than 7,000 merchant vessels on the high seas, Germany more than 2,000, Japan more than 1,000, while the United States, but a paltry 14. Mr. Burns said the only solution of the problem lay in the enactment of some form of ship subsidy.

Fred L. Eberhardt, of Gould & Eberhardt, Newark, N. J., chairman of the committee on the definition of machine tools, covered this subject in his report.

The work of the convention having been expedited at the opening session, the morning's program was advanced to include the presentation of the paper on "The Proper Distribution of Expense Burden", by A. Hamilton Church, of Boston, certified accountant. Thursday afternoon was given over to the meetings of the different machine committees.

### Tool Arrangement Discussed.

Departmental plans of machine tool arrangement on the basis of both product and equipment were the opening topics of the Friday morning session. F. C. Kent, superintendent of the Pierce-Great Arrow Co., Buffalo, N. Y., treated the subject of machine tool arrangement in departments from the basis of equipment, and C. B. Auel, assistant works manager of the Westinghouse Electric & Mfg. Co., Pittsburg, dealt in his paper with the machine tool arrangement in departments on the basis of product. Discussion of these papers, which followed, was participated in freely. A. P. Alford, editor of the *American Machinist*, told of his experiences with plans of machine tool arrangement while connected with the American Shoe Machinery Co. In this shop the different manufactured parts ranged from eight pounds to

three tons in weight and were many thousand in number. The plan first adopted eliminated the machines devoted to manufacturing parts, especially peculiar to the shoe industry. The machine tools devoted to general manufacturing were divided into three classes in accordance with the importance of the work turned out. In the one-shop plan three major objections were found. First, the difficulty of obtaining sufficiently expert foremen to measure up to the increased responsibility; second, and the most serious one, the difficulty of laying the responsibility for failure to get out work within a certain time; and third, the physical arrangement of the shop. A modification of this plan was finally adopted by concentrating machines for the same work in one department.

C. H. Norton, of the Norton Grinding Co., Worcester, Mass., spoke of the good results obtained by concentrating grinding machines in one part of a plant so that all the knowledge of this particular operation could be brought together instead of being scattered over the shop. C. A. Johnson, of the Gisholt Machine Co., Madison, Wis., stated that the best results have been obtained by his company by grouping machines with one foreman in charge, which had been facilitated by the fact that his company had specialized along a special line of machine building. He thought that where the product was the same the very best results were gained by grouping machines. He thought that the matter of shop arrangement exercised a very important influence in arranging the machines into departments but that this difficulty was largely obviated through the modern method of plant construction, which permits of the increasing of certain units without interfering with the remainder of the shop. Fred L. Eberhardt, of Gould & Eberhardt, Newark, N. J., gave it as his judgment that the placing of responsibility was the keynote of the best results in machine arrangement. He thought it very important that the responsibility be placed on one individual in any department. Richard K. LeBlond, of the R. K. LeBlond Machine Tool Co., Cincinnati, questioned whether it would not be better to place different parts of the shop under different management to facilitate manufacturing, because a foreman in any single department frequently has a large number of men and his capacity for getting the best results is accordingly limited.

An interesting account of what some of the English plants are accomplishing by modern arrangement of shop equipment was given by Wm. Hill, representing Alfred Herbert, Ltd., the Butts, Coventry, England, machine tool makers. Mr. Hill said there were prominent instances in England where shops which had been losing money had built new plants and by following the departmental plan of machine arrangement had cut down their costs from shillings to pence and could now successfully operate. He said that in his shop the plan was to conduct a management test after each operation in manufacture to determine whether the workmanship and quality of that operation are satisfactory before the piece is sent to the next finishing process. Mr. Hill stated that the foundry of Albert Herbert, Ltd., is also run on similar lines. In this department, shrinkage and chill tests are taken daily of each class of metal for different characters of work. The metal is poured from the cupola into a chill box ½ x 12 inches in size for the determination of shrinkage and the test piece is then broken to show the chill. Daily records are kept and mixtures are changed accordingly to keep the metal uniform. Grinding operations had been developed to the extent of grouping the machines in charge of a specialist and the speaker stated that this had produced the best of results and at a low cost. Mr. Hill said that department management enabled a manufacturer to discover the faulty work in the intermediate finishing process and thereby to get a better product and very little scrap.

### Taylor on Management.

One of the most interesting features of the program was the address of F. W. Taylor, general manager of the Tabor Mfg. Co., Philadelphia, who covered in a thorough and scholarly manner the principles of scientific management. He stated that the underlying principle of scientific management has for its object the increasing of the output of every individual employed in an establishment and expressed regret that union labor leaders have construed such increase of production to mean loss of employment for the workmen. Mr. Taylor declared this a fallacy and he attributed many of the present industrial troubles of England to subservience to this view. Since wealth is derived from two sources, that which the earth and that which man produces, the speaker said that any community or individual that restricted these processes, restricted the total wealth, and less output means less wealth for the working people, who consume one-twentieth of the world's goods. "Broadly speaking," said Mr. Taylor, "anything that looks toward the permanent restriction of output, represents one of the greatest crimes possible against humanity."

The different trades are learned by tradition in much the same manner today as they were in the Middle Ages. Since knowledge is a workman's chief asset in life and since the knowledge of any foreman is considerably less than the combined science of the men under him, the best results in business are accordingly obtained by inspiring initiative on the part of the latter. The first advantage of scientific management over other forms of management, Mr. Taylor said, lies in the fact that the workman gives his initiative with absolute regularity, after these principles have been thoroughly introduced, requiring usually from two to five years. The greatest gains are obtained from new burdens being assumed by the management. These are, first the development of science, which is derived from the knowledge of the workmen; second, the scientific selection and the progressive development of the workmen; third, the bringing together of the workmen and the science; fourth, the division with the management side, of work formerly performed wholly by the workmen. Mr. Taylor said that in the thirty years experience of scientific management in many industries, there had never been a strike.

### Speaks for Orient.

A plea for greater attention to be given by machine tool builders and other American manufacturers to the trade possibilities of the Orient was presented in an address by Durand C. Alexander Jr., representing the bureau of manufactures of the department of commerce and labor. For the past six years Mr. Alexander has represented the Nicholson File Co., Providence, R. I., in the Orient and has thoroughly familiarized himself with the trade conditions and the market possibilities for American manufacturers in that part of the world. He is now returning to the Far East as a special government representative to devote his attention to the upbuilding of the commerce of the United States with these countries. Mr. Alexander said that there is a good present market for machine tools in the Orient and that by reason of the increase in metal working manufacture, the field is steadily growing. Our trade at present with the whole Orient is less than that with some single European countries but the possibilities for the future,

the speaker said, are greater than in Europe, because of the growing market and the favorable tariff conditions. He urged the American manufacturers to thoroughly establish themselves in this trade but stated that best results could only be obtained through study of conditions.

Upon the motion of Murray Shipley, of the Lodge & Shipley Machine Tool Co., Cincinnati, the convention by a rising vote expressed its appreciation to those who addressed the convention and to the governing committee for its arrangement of a program of such high order.

### Employers' Liability.

The subject of "Employers Liability and Workers Compensation" was discussed at the concluding session Friday afternoon by F. C. Schwedtman, of St. Louis, chairman of the committee on industrial indemnity insurance, and by James A. Emery, of Washington, counsel of the National Association of Manufacturers. Mr. Schwedtman illustrated his remarks by stereopticon views and dealt with the systems now in force in the foreign countries and with those of state laws proposed or enacted in this country. Mr. Emery dwelt upon the principles involved in the question.

The following resolutions on workmen's compensation for injury were adopted:

WHEREAS, the National Machine Tool Builders' Association always desires to occupy a leading position in all constructive work for material efficiency, industrial betterment and particularly for furtherance of harmonious relations between American employers and wage workers; and

WHEREAS, the United States is admittedly less advanced than progressive European nations in respect to employers' liability and injured workers' compensation, to the detriment of the nation, its institutions and its people. Now, therefore, be it

RESOLVED by the National Machine Tool Builders' Association in behalf of humanity, good citizenship, national reputation and industrial progress that a committee be appointed to work in co-operation with similar committees of other organizations for improvement of present conditions on the lines pointed out today by Messrs. Emery and Schwedtman:

First:—Continuous and close relations with state and federal legislators, legislative committees or commissions engaged in the drafting of new liability or compensation bills.

Second:—Close co-operation with all organizations, national, state or local, which are interested in voluntary or compulsory compensation for injured workers.

Third:—Advice to members of our association on voluntary relief systems, liability or accident insurance, accident prevention and accident legislation.

Fourth:—A general educational campaign among the public, the newspapers, the colleges and among business and professional men in general, through the aid of addresses, illustrated talks, circulars and letters, all in the furtherance of our accepted principles for a sound compensation system.

Fifth:—A vigorous general campaign for early adoption of a statistical system on work accidents, so that at the earliest possible moment we may secure facts, instead of guess work, to build upon.

Sixth:—A special campaign among state factory inspectors to the end of securing higher ability and efficiency and less political influence.

Seventh:—The encouragement of mutual insurance and close co-operation with existing insurance concerns, with a view of securing rates for our members, in proportion to their individual accident prevention efforts. And be it further

RESOLVED that the following cardinal principles and explanations shall be the basis of our association's future legislative endeavors;

First:—All legislation must be for compensation. Every kind of employers' liability legislation has proven a failure in every civilized nation.

Second:—Compensation legislation must cover every wage worker. The man who, without his own fault, loses his hand in a farm machine is as much entitled to compensation as the man who loses the hand in an engine gear.

Third:—Compensation must be assured. It must be as certain as the interest on United States bonds. This can be accomplished by insurance preferably guaranteed by the state or United States government. However, every approved method of such safe insurance should be permitted. State, mutual, and stock insurance should be permitted, as well as relief systems covering individual shops must be permitted and none of them must be barred.

Fourth:—Compensation must be efficient. Not less than 75 and preferably 90 cents out of every dollar should be paid to the injured man. To this end, litigation and solicitation expenses must be reduced to a minimum, and arbitration courts are required for a simplified settlement.

Fifth:—Employer and employe are jointly responsible for all unpreventable accidents and should therefore jointly meet the compensation expenditures.

Sixth:—Every injury, except those due to criminal carelessness on the part of the worker, or drunkenness, should be compensated.

Seventh:—Humanity and efficiency demand the prevention of accidents be made of prime importance.

Eight:—Since the progressive individual usually provides voluntarily for reasonable accident compensation, it is right that the reactionary, or selfish individual, be compelled to do likewise through universal compulsory insurance.

Ninth:—To prevent unfair competition between employers in different localities, it is necessary that compensation laws of the various states be reasonably uniform.

Tenth:—Single liability is essential for reasons of efficiency and equity.

Twelve new companies were admitted to membership in the association, at the convention. These were as follows:

Standard Mfg. Co., Bridgeport, Conn.; Cincinnati Gear Cutting Machine Co., Cincinnati; Miami Valley Machine Tool Co., Dayton, O.; Stoever Foundry & Machine Co., Myerstown, Pa.; United States Electrical Tool Co., Cincinnati; Burke Machinery Co., Conneaut, O.; Higley Machine Co., Croton Falls, N. Y.; Massillon Foundry & Machine Co., Massillon, O.; Steinle Turret Machine Co., Madison, Wis.; Cochran-Bly Co., Rochester, N. Y.; Messelbach-Catucci Mfg. Co., Newark, N. J.; Brown & Sharpe Mfg. Co., Providence, R. I.

Among those who registered at the convention were the following:

C. H. Alvord, Hendee Machine Co., Torrington, Conn.
C. H. M. Atkins, The Acme Machine Tool Co., Cincinnati.
B. B. Quillen, The Cincinnati Planer Co., Cincinnati.
Murray Shipley, The Lodge & Shipley Machine Tool Co., Cincinnati.
F. W. Parker, Niles-Bement-Pond Co., New York.
Israel H. Johnson Jr., I. H. Johnson Jr. Co., Inc., Philadelphia.
Fred L. Eberhardt, Gould & Eberhardt, Newark, N. J.
C. H. Norton, Norton Grinding Co., Worcester, Mass.
Fred A. Geier, Cincinnati Milling Machine Co., Cincinnati.
J. C. Small, Aurora, Ind.
Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass.
Harry E. Fisher, Chandler Planer Co., Ayer, Mass.
George J. Burns, Chandler Planer Co., Ayer, Mass.
T. C. Dill, T. C. Dill Machine Co., Philadelphia.
C. J. Wetsel, Baush Machine Tool Co., Springfield, Mass.
H. H. Klusman, Greaves, Klusman & Co., Cincinnati.
A. E. Newton, Prentice Bros. Co., Worcester. Mass.
L. Moulthrop, New Haven Mfg. Co., New Haven, Mass.
Henry Dreses, Dreses Machine Tool Co., Cincinnati.
W. F. Bockhoff, National Automatic Tool Co., Richmond, Ind.
O. B. Iles, International Machine Tool Co., Indianapolis, Ind.
John Bath, Bath Grinder Co., Inc., Fitchburg, Mass.
W. C. Buell, Diamond Machine Co., Providence, R. I.
J. S. Detrick, The Detrick & Harvey Machine Co., Baltimore.
C. E. Thwing, Whitcomb-Blaisdell Machine Co., Worcester, Mass.
D. W. Wood, The Wood Turret Machine Co., Brazil, Ind.
C. A. Johnson, Gisholt Machine Co., Madison, Wis.
C. Wood Walter, The Cincinnati Milling Machine Co., Cincinnati.
Henry K. Spencer, The Blanchard Machine Co., Cambridge, Mass.
W. Oesterlein, The Oesterlein Machine Co., Cincinnati.
A. B. Hazzard, J. Marton Poole Co., Wilmington, Del.
A. A. Dengel, J. Marton Poole Co., Wilmington, Del.
Geo. F. Stewart, The Bradford Machine Tool Co., Cincinnati.
Chas. L. Taylor, The Taylor & Fenn Co., Hartford, Conn.
Richard K. LeBlond, The R. K. LeBlond Machine Tool Co., Cincinnati.
H. W. Kreuzburg, The Champion Tool Works Co., Cincinnati.
D. K. Bartlett, Diamond Machine Co., Providence, R. I.
Wm. E. Gang, The Wm. E. Gang Co., Cincinnati.
O. M. Flather, The Mark Flather Planer Co., Nashua, N. H.
John Becker, Becker Milling Machine Co., Hyde Park, Mass.
J. C. Davis, The Seneca Falls Mfg. Co., Seneca Falls, N. Y.
L. M. Waite, National-Acme Mfg. Co., Cleveland.
G. H. Faetes, The United States Electrical Tool Co., Cincinnati.
Geo. Phillips, Wm. Garden & Sons, Inc., New York.
Morris Condon, H. B. Underwood & Co., Philadelphia.
A. W. Wigglesworth, Universal Boring Machine Co., Hudson, Mass.
J. H. Schwacke, Wm. A. Sellers & Co., Inc., Philadelphia.
H. W. Lucas, Lucas Machine Tool Co., Cleveland.
Paul E. Thomas, Kempsmith Mfg. Co., Milwaukee.
P. R. Lopaint, Lopaint Machine Tool Co., Hudson, Mass.
Edwards B. Welles, Charles H. Besly & Co., Chcago.
John Miller Jr., Charles H. Besly & Co., Chicago.
A. R. Stedfast, Hill, Clarke & Co., Inc., Boston.
H. H. Wheeler, Union Mfg. Co.
E. C. Henn, National-Acme Mfg. Co., Cleveland.
E. C. Woolgar, National-Acme Mfg. Co., Cleveland.
Geo. W. Ford, The Cleveland Planer Works, Cleveland.
M. A. Coolidge, Fitchburg Machine Works, Fitchburg, Mass.
J. A. Svensson, Rochester Boring Machine Co., Rochester.
W. A. Sibley, Sibley Machine Tool Co., South Bend, Ind.
J. B. Doan, The American Tool Works Co., Cincinnati.
P. P. H. Conover, The Miami Valley Machine Tool Co., Dayton, O.
T. K. Duffield, Philadelphia Bourse, Philadelphia.
H. R. Forbes, Lumen Bearing Co., Buffalo, N. Y.
W. J. Belcher, The Whitney Mfg. Co., Hartford, Conn.
E. E. Blundell, Cleveland Automatic Machine Co.
C. A. Clark, Boston, Mass.
N. E. Zusi, Newark, N. J.

# Will Be No Friction in International Relations

## Of Iron and Steel Makers, Prediction of Duke of Devonshire at Meeting of Iron and Steel Institute—Papers Discussed

The spring meeting of the Iron and Steel Institute was held in London, Thursday and Friday, May 11 and 12, at the Institute of Civil Engineers, Westminster, under the presidency of the Duke of Devonshire. There was a large attendance of members.

The president said they had all heard with sorrow and regret of the death of their old colleague, the late Lord Airedale. He was a past-president of the Institute, and received the Bessemer medal in 1903. Until last year, he attended every meeting.

The report of the council stated that the year had been one of continued progress. His Majesty King George had graciously acceded to the request of the council to accept the position of patron of the Institute. Ninety new members had been added during the year, bringing the total to 2,147. Among the distinctions received by members during the year John Fritz, Prof. H. M. Howe and James M. Swank had been elected honorary members of the American Iron and Steel Institute. The losses by deaths had been unusually heavy, comprising 42 names. The finances showed continued prosperity, the total receipts being £6,428, and the expenditures £5,812. Vacancies on the list of vice presidents had been filled by the appointment of Wm. Evans and J. E. Stead, F. R. S.

Prof Arnold, in felicitous terms, moved a vote of thanks to the president and council. The Institute held a strong position throughout the world. He heard rumors of the coming establishment of an international iron and steel institute, but in his humble opinion the formation of such a body was wholly unnecessary. The existing Institute was essentialy an international body capable of dealing with all questions of iron, steel and metallurgy.

Sir Thomas Wrightson, seconding, said the council had done most splendid work.

The president, responding, said that with regard to the establishment of an international association the promoters had been most anxious to secure that there should be nothing approaching friction or confusion of ideas. Everything had progressed on the most friendly and amicable lines, and the conclusion would prove satisfactory to all concerned. They were very grateful for the valuable services rendered by Mr. Lloyd. The president next presented Prof. Le Chatelier the Bessemer medal, remarking that the professor was a very well-known member of the council, belonging to a French family several members of which, and in particular his father, had rendered distinguished service in metallurgical research. The professor had occupied scientific chairs in many institutions. They purposed also to have presented the medal to M. Felix Robin,

THE DUKE OF DEVONSHIRE
President of the Iron and Steel Institute.

but on account of his serious illness they proposed to defer the presentation until the autumn meeting.

This concluded the preliminary business and the meeting then proceeded with the reading of papers.

### Dessication of Air.

The first paper taken was on "Notes on a Process for the Dessication of Air by Calcium Chloride", by Felix A. Daubine and Eugene V. Roy (Aubone. Meurthe-et-Moselle).

Prof. J. H. Harrison (Middlesbrough) said the process of dessication which was formerly ridiculed was now admitted to be correct and still other processes were coming forward. They all agreed that by the dessication of blast there was a means of saving something like 10 to 20 per cent of coke and the method was very much better than anything previously put forward. It was a disadvantage that it was intermittent in that it required three separate apparatuses to do the work. It would be useful if some idea of the cost were given, a matter which was left in doubt.

Dr. J. E. Stead said the process of dessication seemed to have met the difficulties and disposed of the practical objections. The plan of first of all cooling down with cold blasts was a very valuable one. But the apparatus must have a long trial before they could finally determine its practical value. What people were doing in steel works would simply make their grandfathers turn in their graves. They found it now absolutely necessary to apply laboratory processes to metallurgical work.

### Welding Up Blow Holes.

Dr. J. E. Stead read his paper on "Welding Up Blow-Holes and Cavities in Steel Ingots."

Prof. Arnold, opening the discussion, produced a series of steel specimens showing blow-holes and cavities. These included two half ingots of exactly the same weight. One was cured of its blow-holes by introducing a small quantity of aluminum and the effect of the aluminum was marvelous. But generally speaking, if they got rid of the blow-hole difficulty, another difficulty would crop up.

C. H. Ridsdale (Middlesbrough) said in forgings, hollowness was sometimes produced through working at too low a temperature to save reheating. As a rule, the forging closed up the blow-holes. It depended on the conditions of working whether they re-opened.

Prof. McWilliams related some experiences of blow-holes at Sheffield University, which dealt with nickel direct from the core and the students had an ingot which began to rise and they put on damp sand to wedge it down. Eventually, it got up to about 18 inches off the bottom plate.

Dr. Rosenhain pointed out that the mere fact that a blow-hole did not reopen did not prove that it was welded,

but simply that gases were forced away from that point. But it was going a little too far to say that a slightly blue surface was not weldable.

Dr. Stead briefly replied to the discussion and was thanked for his paper.

### Welding Discussed.

A paper on a kindred subject was that by E. F. Law, W. H. H. Merritt and W. Pollard Digby, on "Some Studies on Welds," which was next read.

Prof. Turner (Birmingham) expressed his great preference for the modern methods of welding. There were occasionally defective welds in the acetylene process, but that was because the processes were not properly carried out. When properly done, they were perfectly satisfactory. The tensile and other tests showed that when properly carried out the welding was perfect.

Dr. Stead remarked that it was quite possible to tell the method of welding adopted by subsequent microscopic examination.

Sir Thomas Wrightson pointed out that while any metal could be melted there were only certain materials that could be welded together. Mr. Law briefly replied.

Other papers read were "On the Action of Aqueous Solutions of Single and Mixed Electrolytes on Iron," by J. Newton Friend, D.Sc., and Joseph H. Brown (Darlington); "The Corrosion of Steel," by Percy Longmuir, B. Met. (Sheffield), and on "The Relation of Impurities to Corrosion of Iron," by John W. Cobb (Leeds).

The meeting adjourned until Friday.

### Second Day's Proceedings.

The proceedings were continued on Friday in the Institution of Civil Engineers, his Grace, the Duke of Devonshire, again presiding.

The secretary announced the following awards of Carnegie scholarships, each of the value of £100. Dr. W. H. Guertler (Berlin), G. Hailstone (Birmingham), K. M. Keeney (Colorado, U. S. A.), and G. D. Rohl (Freiburg, in Saxony). Further grants of the value of £50 had been made to J. Newton Friend (Darlington) and T. Swinden (Sheffield).

Dr. Carpenter read in summary his paper embodying Parts II, III and IV of his study of "The Growth of Cast Irons After Repeated Heatings."

A comprehensive discussion was introduced by Dr. J. E. Stead, who told quite a fascinating story of some experiments with common forms of expansion. He had an opportunity of examining the battill plate of an ordinary hot water stove of a fireplace. Part of the door had been burnt away. It was originally 17 centimeters square and after being heated for about 10,000 hours at a temperature varying from 600 at one end to 800 at the other, the size stretched at one end to 20 centimeters and the specific gravity was enormously altered. At the point of greatest expansion, there was left only 30 per cent of metallic iron and the whole of the intervening space was slag matter due to the penetration of the oxidizing gases which made the metal porous to the extent of one-twentieth of the whole bulk. When put in water, bubbles of air escaped to the surface, the whole surface being like a sponge. When heated to 900 degrees, the graphite was replaced with oxide of iron. With long-continued heating, both the silicon and the phosphorus passed out into the oxide. The whole of the silicon was in the slag and practically all of the phosphorus. But the phosphorus would not diffuse into the silico-ferrite as long as it was saturated with carbon. The moment the carbon went out, the phosphate began to diffuse into the ferrite. The piece of stove pipe after six years' heating was like a sponge, although not heated to more than 750 degrees Cent. Although 25 per cent of the silicon was actually present, the structure of the stove pipe almost exactly resembled that of the original pig iron. A simple illustration might be found in the tongs used for removing slags from the furnace, which always contracted in length so that the jaws fell in. It was not a case of contraction but a case of distribution of matter from one place to another. Some large tongs used at Stockton Malleable Iron Works, used for removing slabs from a hot furnace, which originally measured 2 feet 6 inches, contracted in length 5 inches. If the heating had been continued long enough, the oblong bar would eventually have become a sphere. Every time a bar was quenched in water, the outside contracted and the first effect was to jump in the outside and so compress the internal plastic mass, and so bulged it out. When cast steel tongs were used instead of wrought steel, the outer surface cracked. The whole mass became porous and easily permeable with gas. In an experiment with two pieces of steel, one containing no silicon and the other 4 per cent of silicon and the same amount of carbon, the oxidation of the non-silicon steel was 50 times as great as that containing 4 per cent. The silicon alloy was more oxidizable than the non-silicon one.

E. H. Saniter (Rotherham) said that most people who had used mild steel for ingot molds had abandoned them in favor of cast iron. He found steel worked badly on the attachment portion of mechanical charging boxes.

Prof. T. Turner (Birmingham) pointed out that there appeared to be no parallel between the total amount of expansion and the total amount of gas evolved. But further attention should be directed to the effect of reheating on shape and ductility. They were dealing with temperatures at which phosphorus would be absorbed. Apparently some of the volume changes were connected with alteration in the silicon iron and carbon compound.

W. J. Foster (Birmingham) thought the whole matter was simply one of the super-saturation or the dilute solution of the carbon iron. He would get the total carbon down as low as possible in the first place. A pipe with 0.4 per cent phosphorus would last longer than if the iron were cast with hematite. The growth would be considerably more with iron melted in a cupola than in an air-furnace, because the iron was more saturated.

At this stage the Duke of Devonshire left to attend a committee of the House of Lords, and G. Ainsworth took his place for the rest of the session.

A. Tucker (Birmingham) said he was satisfied that to substitute mild steel for cast iron molds was invariably a failure.

E. Adamson (Sheffield) said that in a series of experiments he found that cast iron containing 1 per cent phosphorus and 1 per cent manganese grew considerably less than any hematite iron used. He found that for gas retorts the lower the sulphur used the longer the life of the iron, but whether sulphur caused the growth was not yet determined. The growth apparently depended upon the condition of the carbon at the commencement of the heat treatment and the subsequent changes in the carbon. The dominant partner governing changes was carbon plus temperature and time independently of any other constituent.

W. H. Hatfield (Sheffield) said he could not accept the statement in the paper that certain of the special alloys prepared by Dr. Carpenter machined like malleable iron; they were extremely hard, though it was true

they could be machined with proper tool steel.

Dr. Carpenter thanked the speakers and promised to reply in writing.

A vote of thanks was accorded the author.

Prof. Arnold (Sheffield) then read his paper an "The Chemical and Mechanical Relations of Iron, Chromium and Carbon."

Dr. Stead considered the general conclusions satisfactory and justified. Obviously chromium had a good future before it. Chromium, while a good friend, was a very bad enemy. But for chromium, enormous quantities of ore in Greece could be utilized and other ores containing 3 per cent of chromium, now sold on that account at 4 shillings less than they otherwise would. If that chromium could be got rid of, vast stores could be worked. At present they were rather a drug on the market. There was a great field for the metallurgical chemist in dealing with chromium ores and so utilizing them with great advantage to the trade.

Neville Huntley said the paper had an important bearing on the theory of high speed steels and must be the foundation of any theory for the hardening of such steels.

Prof. Arnold promised to reply to the discussion by correspondence.

### Influence of Vanadium.

Prof. MacWilliam read the paper on "The Influence of 2 Per Cent of Vanadium on Steels of Various Carbon Content," prepared by himself and by E. J. Barnes (Sheffield).

Dr. Stead said the paper was not only admirable for its classification but furnished another instance of the colossal amount of work being done at Sheffield. It was interesting to find the enormous influence that vanadium had upon the physical properties of steel. In view of the work done by Prof. Arnold, vanadium steel ought to be called Arnoldite steel.

The paper by W. H. Hatfield (Sheffield) on "The Influence of Vanadium on Cast Iron," was read by the author.

Kent Smith, for some years resident in Pittsburg, and now engaged in Liverpool in the manufacture of vanadium, contributed a lucid and comprehensive statement on the influence of vanadium, which made an excellent impression on the meeting. The speaker said nearly all his work since 1893 had been in the application of chromium vanadium to steel manufacture. He was convinced that the action of vanadium was beneficent in at least three different ways. Especially it was a most efficient scavenger and differing from all other scavengers in that it put the material in the best condition to receive the further benefits to be conferred. Vanadium steel was much more resistant to wear and to the formation of slip bands than ordinary steel. Whether that was entirely due to thorough scavenging was a moot point. He thought the ferrite had the power of dissolving some of the vanadium. It is possible to produce steels of very high quality by its means. Years ago, advocacy of vanadium was regarded as merely the ebullition of cranks. But the consumption in the United States was now very large. There was now being absorbed annually, chiefly in steel manufacture 250,000 pounds of vanadium, equivalent to about 50,000 average vanadium ingots, representing about 5 pounds per ton of steel. Its performance had more than fulfilled the most sanguine expectations. That was used almost in its entirety for chromium vanadium steel. Some of it was used with a very small amount of nickel. A short time ago, he assisted in the preparation of 66 tons of vanadium steel which was not less easily made than ordinary steel. It was rolled with the greatest ease and some inch and a quarter bars were tested under various conditions. A bar was heated and quenched in whale oil from 830 degrees Cent., drawing it back to 625 in air. The elastic limit of the steel was 56 tons, the ultimate stress 62½ tons and the elongation 24 to 25 per cent with a reduction of area of 53 per cent. The test piece was machined from the core of the bar and treated in its entirety. Another portion was bent quite double. Under the kinetic test of Irgod, the standard specimens absorbed 10½ pounds of energy before fracture, which was more than one would expect from a very high annealed carbon steel of one-third the elastic limit. With another kinetic test, that of Vohler, the metal started with a fiber stress of 25 tons per square inch set at 100,000 revolutions, and then increased to 30 tons and another 50,000 revolutions; then to 35 adding 50,000 more revolutions; to 40 tons and 17,000 revolutions. Another part of the bar bent cold to right angles and after this had been repeated a number of times the bar still remained without sign of fracture. Vanadium properly treated would confer great benefits upon steel. The extreme resistance to abrasion made this alloy of great value for railroad tires and was generally used for that purpose in the states. With regard to cast iron. One of its great services was the elimination of porosity, which was such a serious trouble to the ironfounder, especially with delicate castings involving great changes of section. There were in the states hundreds of cylinders in use made of vanadized iron which more than fulfilled the early promises of the alloy. A pair he had tested after two years trial showed 300 per cent more favorably than those of ordinary metal. It was especially suitable for valve bodies having to stand great pressure. At one works where they had numerous rejections of nearly finished work, vanadium had enabled the company to avoid that expensive disaster, and they had a better article at a lower net cost. (Applause.)

Dr. Stead remarked that manganese would give precisely the same scavenging result at less cost.

Mr. Hatfield said that was his point.

Dr. Stead:—"Vanadium is enormously expensive and you get only the same result."

I. Lester said they were hearing a lot about the specialized steels, but they had better wait and see what was the best position. If they produced at a high temperature they would get a higher amount of impurities. If they got the right mixture, as they did with cold blast Staffordshire iron, they would get a good article without using expensive vanadium.

Mr. Hatfield, replying, said he did not wish to throw any doubt upon the valuable properties of vanadium. Ordinary cast iron, with its various ranges of composition, was capable of being produced with all the properties and merits he claimed for the vanadium composition. Probably the same care bestowed on ordinary cast iron would yield better results.

The last paper read was that by C. H. Ridsdale, F. I. C., and N. D. Ridsdale (Middlesbrough), on "Mechanicalizing Analysis as an Aid to Accuracy and Speed for Commercial Purposes." After a brief discussion of this paper, the session closed with the customary votes of thanks.

### The Annual Dinner.

A new departure was made in connection with the annual dinner in the fact that for the first time it was held in the Connaught rooms, the handsome suite of apartments chosen last year for the dinner of the American Institute of Mechanical Engineers on the occasion of its visit to this country last year. The guests numbered 320, presided over by the president, the Duke of Devonshire, and included the following: The

Marquess of Bristol, M. V. O., Lord Aldenham, Lord Allerton, Lord Muncaster, Lord Shuttleworth, Sir Hugh Bell, Bart. (past president), Sir W. Thomas Lewis, Bart., K. C. V. O. (vice president), Sir H. Llewellyn Smith, K. C. B., Major B. F. S. Baden-Powell, Colonel Bagnani (military attache of the Italian embassy), Sir Clifford Cory, Bart., M. P., Percy C. Gilchrist (vice president), Sir William White, Sir Fortescue Flannery, M. P., Arthur Cooper (vice president), Sir George Scott Robertson, K. C. S. I., Sir Walter Menzies, M. P., Prof. H. Le Chatelier (Bessemer gold medallist), A. T. Tannett-Walker (vice president), J. S. Harmood-Banner, M. P., J. W. Summers, M. P., Dr. R. T. Glazebrook, C. B., B. A. Whitelegge, C. B., G. H. Caughton (chairman, London & Northwestern railway), J. S. Ainsworth, M. P., Alex. Siemens (president, Institution of Civil Engineers), Dr. J. E. Stead (vice president), B. E. Peto, M. P., F. H. Booth, M. P., William Evans (vice president), E. G. Sehmer (Germany).

The usual royal toasts having been honored on the proposition of the president, Sir Hugh Bell (past president) proposed the toast of "The Imperial Forces", which was responded to by the Marquess of Bristol, who claimed that whatever increase was made by foreign countries, the British navy should still be maintained supreme. He sincerely hoped that the air ship would not be a success.

Major B. F. S. Baden-Powell, responding, considered the army nothing like as strong as it ought to be and was less strong than years ago. He believed the modern navy would be of little use against the air ship, which would introduce such a puzzling element into war that he hoped the result would be universal peace.

The toast of "The Guests" was proposed by Arthur Cooper (vice president) and responded to by Lord Allerton, who delivered a thoroughly practical speech. The iron and steel industry, he said, was the most important of all the industries of the country, and whatever the British iron and steel manufacturers were doing in the world race in regard to quantity, he sincerely hoped they would maintain the quality as it was their bounden duty to do. In his everyday experience of railway work, he found they were called upon to provide machinery and permanent way which their fathers and grandfathers never dreamed of. In regard to engines and permanent way, there are strains and stresses such as had never been felt before. Whether Germany galloped ahead as regards quantity of output and America still turned out its millions of tons, he hoped and he was glad to believe that as to quality Great Britain still held the field. That would be still more necessary in future. (Applause.) The toast was also responded to by J. S. Harmood-Banner, M. P., who pointed out that the great prosperity of America and Germany was due to the fact that those countries availed themselves of the discoveries of Bessemer, Siemens and Gilchrist.

Sir H. Llewelyn Smith, K. C. B., proposed the toast of "The Iron and Steel Institute", describing the industry as dominant alike in the arts of war and the arts of peace. It had wrought a complete revolution in the constructive arts. One could only speculate what use the builders of the cathedrals would have made of iron and steel if the metals had then been available, but they would have made a fitting and beautiful use of them. In that direction, there were vast possibilities in the future. The Institute knew no national bounds or international controversies. The only warfare was the struggle to subdue and harness the vast forces of nature for the service of mankind.

The Duke of Devonshire, responding, said he had neither the practical nor scientific qualifications for which presidents were elected. The Institute had, however, recognized the hereditary link existing between the industry and his own family. He was greatly impressed by the fact that the papers and discussions were largely supplied by comparatively young men. Throughout the length and breadth of the land, there were many young men, a large proportion scarcely past the age of students, who were devoting themselves heart and soul to mastering the science of the industry. He was struck with the large number willing to come forward and take their part in the discussions with those under whom they had studied as pupils, to work solely for the good of the industry. The great work of the Institute was recognized by other countries, and it was a great pleasure to present the Bessemer medal, the most distinguished honor they had to bestow, to an eminent colleague from France. They fully recognized the great value of the work done in other countries. In conclusion, His Grace thanked their Italian friends for the kind invitation to visit Turin in the autumn, and he hoped that invitation would be very numerously responded to.

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The Wright Wire Co., Worcester, Mass., is erecting a new building in connection with its plant at Palmer, Mass.

## ENGINEER NAMED

**On Quebec Bridge Board—Austrians Order Canadian Cars.**

Toronto, Can., May 22.

Contracts have been awarded for the completion of the Toronto-Ottawa line of the Canadian Northern railway, 250 miles long, the successful tenders being J. P. Millarkey, Montreal, and A. Sinclair and Ewan Mackenzie, Toronto. The section between Toronto and Belleville is nearly finished and will be in operation some time this summer.

The railway department of the Austrian government has decided that the observation cars of the Canadian Pacific railway are best adapted to increase the popularity of tourist travel and has contracted for the construction of some of these cars at the Angus shops, Montreal, to be shipped as soon as possible.

C. C. Schneider, of New York, a former president of the American Society of Civil Engineers, has been appointed by the Canadian government a member of the commission of engineers in charge of the construction of the Quebec bridge. The St. Lawrence Bridge Co., which has the contract for the superstructure, is arranging to establish an assembling plant at the bridge site.

The Buffalo Brake Beam Co. has decided to establish a Canadian branch at Brantford. A site has been selected and the company hopes to be able to begin manufacturing operations in two months.

The John Whitfield Co. of Toronto, has purchased a site at Jane and Bloor streets in the western part of the city and will shortly erect a foundry.

The town of Aurora, Ont., has voted a loan of $10,000 and exemption from taxes to the Positive Clutch & Pulley works.

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## St. Louis Shipments

Receipts and shipments of pig lead and spelter at St. Louis for the last two weeks were as follows:

| | Zinc and spelter. | Pigs of lead. |
|---|---|---|
| Received:— | | |
| For the week ending May 13... | 69,990 | 48,220 |
| For the week ending May 20... | 86,630 | 24,370 |
| Shipments:— | | |
| For the week ending May 13... | 118,000 | 18,670 |
| For the week ending May 20... | 104,610 | 21,400 |

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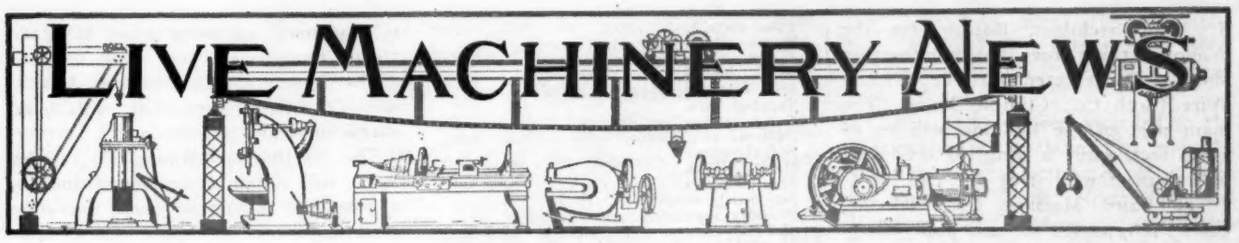
The Jaeger Machine Co., Columbus, O., builder of special machinery and labor-saving devices, has completed the construction of a new factory for the purpose of manufacturing its "Jaeger-Keny" hydraulic block press, concrete mixer, rod angle drives, etc.

# LIVE MACHINERY NEWS



*In New York, a little business is reported, but sales, in general, are rather slow. It is expected that a number of enterprises, among which are the deep pressure tunnel and subway extensions, will shortly have a stimulating effect on the market. In Chicago, somewhat better tone is reported and sales of machine tools in small lots are more numerous. The Santa Fe railway has issued an important list for considerable general machinery. In Pittsburg, although the market is still very quiet, the railroads are paying more attention to their needs and some inquiries are expected to appear in the near future. The Westinghouse Machine Co. reports that business in April exceeded that of any other single month in 1911, and showed a 10 per cent gain over the corresponding month in 1910. In Cleveland, a number of small transactions are reported but no new inquiries of importance have appeared.*

## Water Works

The Alvarado Consolidated Mines Co., Parrel, Mex., will install a large pumping plant.

M. B. Summers and F. B. Schwentker, of Albuquerque, N. M., will install a pumping plant to irrigate 2,000 acres.

C. E. Hartley and C. F. Hortenstein, Springer, N. Mex., are planning an irrigation system near Raton.

The city of Exeter, Cal., is considering the installation of a municipal water plant. The system will include a 60,000-gallon steel tank.

The city of Sacramento, Cal., is preparing to vote on a bond issue of $200,000 for the installation of a new pumping unit, to be added to the municipal water works.

The city of Nashville, Tenn., is in the market for a boiler feed pump, to be installed in the pumping station of the water works. Address the board of public works. Bids close May 30.

A large irrigation system involving the expenditure of $400,000 is being planned near Alturas, Cal., by N. J. Barlow, Timothy Spellacy and L. C. Haynes, of Los Angeles. A number of pumping plants are involved.

## Machine Tools

The H. C. Tack Co., Cleveland, is erecting a machine shop, 75 x 150 feet.

The Knickerbocker Auto Truck Co., East 101st street, New York city, has plans under way for extensive improvements. Included is a considerable amount of machine tool equipment, which, it is understood, will be inquired for at an early date.

The Atchison, Topeka & Santa Fe railway is in the market for the following machine tools, included in a list issued in Chicago territory, May 18:

3—28-inch x 14-foot engine lathes.
2—24-inch x 10-foot engine lathes.
3—18-inch x 8-foot engine lathes.
1—30-inch x 14-foot engine lathe.
1—36-inch x 18-foot engine lathe.
1—90-inch drive wheel lathe.
1—32-inch shaper.
1—16-inch or 18-inch slotter.
1—18-inch x 8-foot tool room lathe.
1—No. 3 universal milling machine.
1—Oil burning furnace.
1—Jones & Lamson, 3-inch x 36-inch flat turret lathe.
1—Flue welding machine.

The Santa Fe is also taking prices on another list issued a short time ago. The tools in this list are as follows:

1—36-inch x 18-foot engine lathe.
1—18-inch x 8-foot engine lathe.
2—20-inch x 10-foot engine lathes.
2—28-inch x 14-foot engine lathes.
1—Twist drill grinder.
1—42-inch drill press.
1—14-inch sensitive drill.
1—4-foot radial drill.

## Railroads

A new round house with stalls for 15 engines is to be built at Princeton, Ky., by the Illinois Central railroad, it is reported. A. S. Baldwin, of Chicago, is chief engineer.

The Louisville & Nashville Railroad Co. will double the present capacity of its shops at New Decatur, Ala. Boilers and electrical machinery will be required. W. H. Courtney, Louisville, Ky., is chief engineer.

The Louisville & Nashville Railroad Co. will spend $100,000 at Evansville, Ind., in enlarging its shops and yards in order to handle the business of the Big Four, which will use the L. & N. terminals when the extension of the former to Mt. Carmel, Ill., is completed.

The Atchison, Topeka & Santa Fe railroad is planning a large number of improvements on its system. A power house will be built at Galveston, Tex., machinery for which is estimated to cost $6,200. A small electric cut-off and rip saw mill will be installed at Somerville, Tex., at a cost of $2,000. A 40-kilowatt electric generator, to cost approximately $3,000, will be installed at Waynoka, Okla. A machine and blacksmith shop will be constructed at Galveston, Tex., at an estimated cost of $10,000. An additional air compressor has been authorized for use at Brownwood, Tex., involving an expenditure of $3,300. A new six-stall, brick, southern type round house will be constructed at Silsbee, Tex., at a total estimated cost of $20,000. The present engine house at Galveston, Tex., will be replaced by a 16-stall, brick structure at an estimated cost of $52,000. A brick storehouse with oil basement and platform will be constructed at Galveston, Tex., at an estimated cost of $17,000.

## New Works

The rebuilding of the plant of the Gadsden Pipe & Fittings Co., Gadsden, Ala., has been indefinitely postponed.

The Youngstown Carriage Co. has awarded a contract to Harry D. Stonebrook for a new brick shop building, 100 x 150 feet.

Bids are being taken by the Kurtz Brass Bed Co., Corry, Pa., on a one-story factory building, to be added to its present plant.

The Union Twist Drill Co., Athol, Mass., is building a small addition to its plant. The improvement consists of an enlargement to the cutlery department, 37 x 100 feet, one story high.

The Fiber Barrel Machinery & Mfg. Co., South Ninth and Sarah streets, Pittsburg, will complete plans in about a week for the erection of a factory in which light machinery will be manufactured. J. V. Walsh is president of the company.

Bids are being received by Charles

T. Main, architect, Boston, for the proposed three-story hexagon netting shop to be erected for the Clinton Wire Cloth Co., Clinton, Mass. The main part of the building will be 84 x 165 feet, while a wing, 40 x 52 feet, will connect with it at one end.

The Baird Machine Co., Oakville, Conn., is reported to have plans ready for beginning the construction of a new plant in the locality of Bridgeport, Conn. Contracts will be let at once for the erection of a one-story machine shop, a power house, a two-story office building, and a pattern shop and store house.

The Cross & Brown Co. has completed negotiations for leasing to the Mohegan Tube Co. a large site and several buildings, on the north side of Davis street, Long Island City, N. Y. The Mohegan Tube Co. is at present located at 530 to 550 West Twenty-third street, New York. The company manufactures brass-covered steel tubing.

The American Foundry & Construction Co., Pittsburg, has awarded a contract to the Pittsburg Bridge & Iron Works for a new pattern storage building, to be erected at Hazlewood, Pa.

The Pioneer Pole & Shaft Co., W. A. Snyder, president, Cairo, Ill., is planning the construction of a new factory, to contain 60,000 square feet of floor space. The cost is estimated at $100,000. Considerable machinery will be required.

## Foundries

It is reported that the Star Foundry Co., Albert Lea, Minn., is erecting a new foundry at North Waterloo, Ia.

The Universal Castor & Foundry Co., Jackson street, Newark, N. J., manufacturer of furniture castors and light castings, has its large new plant on South Ferry street, Newark, well under way, and will probably move into it about Sept. 1. The plant consists of one large structure, one and two stories high, that covers about an acre. New York machinery houses are anticipating an inquiry for considerable machinery for the new building.

The Baltimore Gas Appliance & Mfg. Co., Bayard and Hamburg streets, Baltimore, has forwarded a list of machinery and other equipment which it is in need of for its proposed new foundry and other buildings. R. W. Hunter is president of the company. The list follows:

63-inch shell cupola, 63-inch shell lined up to 40 or 45 inches.
Fire brick lining.
Blast gate (sliding type blast gate).
Blower (motor driven).
Large core drying oven.
Hand ladle shanks.
Cast ladle bowls.
Car trucks for pig iron, coke, castings.
Flask wheelbarrow.
Iron wheelbarrow for cupola.
Wood wheelbarrow.
Molders' shovels (split handle).
Coke forks.
No. 4 riddles, galvanized wire.
No. 8 riddles, galvanized wire.
No. 2 riddles, heavy wire.
Butt stick.
Tapping bars.
Cupola picks; two designs.
Bellows, soft leather.
Soft brushes.
Hard brushes.
Floor rammer.
Set bench rammers.
Foundry sprinkling cans.
Mallets, 1¼ by 2½ inches.
Snap flasks; about six.
Wire brushes; five rows wire.
Heavy stove plate facing.
Return facing.
Fire clay.
Molding sand.
Core lake sand.
Annealed core wire.
Facing bags.
Flask pins.
Flask hinges.
Flask clamps.
Core chaplets.
Crucibles.
Crucible tongs.
Cinder mill (back of cupola).
Round mills for cleaning.
Square mills for cleaning.
Horizontal drill lathe.
Upright drill lathe.
Bench vises.
Wood patternmakers' work benches.
Band saw.
Wood trimmer.
Wood turning lathe.
Large pipe threading machine.
Pipe cutter.
Multiple drill.
Facing mixer.
Buffalo forge drill press.
Tapping machine; upright or horizontal.
Small speed lathe.
Sensitive drills.
Large press.
Middle size press.
Tilting press.
Wire straightener.
Horse shoe press.
Miter press notcher.
Square shear, 60-inch blades, 16-inch gage capacity.
Foot power shear.
8-foot brake.
3-foot brake.
Forming rolls.
Bar folder.
36-inch groover.
No. 4 beader.
18-inch deep throat lever shears.
No. 5 flanging machine.
Truck for sheet iron.
Fan and dust arrester, for mills.
No. 2 stove trucks.
Emery stands for castings.
Blacksmith forge and anvils.
Twist drill cabinet with full set of drills.
Files; all sizes.
Trimo wrenches; three sizes.
Monkey wrenches.
Drill chucks.
Glue.
Glue pots.
Grindstone.
17-inch swing engine lathe, 3½ feet between centers.
Universal milling machine.
Shaper, 20-24-inch stroke.
Drill grinder.
Electric portable grinder.
Crimper.
Electric welding machine.

## Power Plant Equipment

Lafayette, Ky., is contemplating the erection of an electric light plant.

The city of McKenzie, Tenn., will spend $40,000 in adding to the equipment of its electric light plant.

Rosenberg, Tex., is arranging for the installation of an electric light and power plant.

Eufala, Ala., will receive bids until June 7 for the construction of a municipal lighting plant.

The Low Pass Mining Co., Granite, Col., will build a new hydro-electric plant in the near future.

Prices on gasoline engines, to be used in a printery, are being asked by G. G. Hyatt, Ducktown, Tenn.

The Sacramento Gas, Electric & Railway Co., Sacramento, Cal., will build a new auxiliary power plant.

The North Star Mining Co., Globe, Ariz., will install a compresser and lay a pipe line to connect with the other workings.

The F. N. Burt Co., Buffalo, is building and equipping a new power house, elevator shaft and chimney at a cost of $25,000.

A 50-horsepower gasoline engine is wanted by the John G. Duncan Co., Knoxville, Tenn. Second-hand equipment is preferred.

Dyersburg, Tenn., is planning extensions in its electric light plant, a bond issue of $30,000 having been approved by the voters.

A bond issue of $120,000 has been voted by the citizens of Hastings, Mich., for the construction of a hydro-electric plant.

The Winnemucca Water Co. of Winnemucca, Nev., will install a pumping plant and electrical generating machinery.

The Livingston Light & Power Co., Livingston, Tenn., is planning to equip a plant. W. W. Hendrix, Cookeville, Tenn., is interested.

Greeneville, Tenn., is planning the establishment of electric light and water works systems, and will vote on a bond issue of $65,000, June 5.

The Keokuk Railway & Power Co., Keokuk, Ia., A. D. Ayres, manager, is considering installing a large amount of generating machinery.

The board of education of the Depew union schools, Depew, N. Y., will receive bids until June 6 for installing a heating and ventilating system.

The Louisiana Light, Power & Traction Co., Louisiana, Mo., has commenced work on a power house, 50 x 80 feet, which will contain electric generating machinery.

Edwin F. Barlow, constructing quartermaster, Fort Morgan, Ala., will receive bids until June 2 for a motor-driven deep well pump, transformer, etc.

Plans have been prepared by the Fallston Fire Clay Co., New Brighton, Pa., for practically rebuilding its power plant. The present plant was damaged by fire recently.

The village of Rockville Center, L. I., is about to make an appropriation of $17,000 for the erection of a power house. Two 800-horsepower boilers will be installed.

The board of commissioners of Birmingham, Ala., may enlarge the small lighting plant in North Birmingham and provide service for the entire municipality. Equipment at an estimated cost of

$100,000 will be required if the plant is decided upon.

The Southern Power Co., Durham, N. C., is planning to erect a steam power plant at a cost of $250,000. Albert Milmo, Charlotte, N. C., is consulting engineer.

Water power is to be developed at Manchester, Tenn., by the Duck River Power Co., which was chartered recently. J. F. Boyd, J. E. Huffman and S. S. Hix are among the incorporators.

The Knight-Weller Co., Knoxville, Tenn., which was recently chartered with $2,000,000 capital stock, has announced plans for developing hydro-electric power in Tennessee. Charles A. Weller, Knoxville, is interested.

We are advised by F. J. Cross, Chicago, that operations have commenced on the construction of a hydro-electric plant at Central City, Ia., on the Wapsipinicon river. Light and power will be furnished to Central City, Alburnett, Center Point, Urbana and Walker. The plant at Central City will cost about $30,000.

The Dominion Power & Transmission Co., Hamilton, Ont., is planning to increase the capacity of its generating plant at Decew Falls from 38,000 horsepower to 60,000 horsepower. The company is erecting a new building and laying two additional penstocks to carry the water to the new turbines to be installed.

A hydro-electric plant, capable of developing 60,000 horsepower and supplementary to the plant which is now being completed, has been planned by the East Tennessee Power Co., Knoxville, Tenn., for erection on the Ocoee river, near Ducktown, Tenn. It will not be begun until after present plant is put in operation.

Articles of incorporation have been filed at Lexington, Ky., by the Kentucky Traction & Terminal Co., which has a capital stock of $2,000,000. The company plans the erection of a power house and the extension of lines of several traction properties, which have been taken over. General Manager Oppenheimer is in charge.

The New York, New Haven & Hartford Railroad Co. has announced plans for making an important enlargement to its power plant, which supplies current for the New York division of its system. An extension, involving four 4,000-kilowatt generators, will be made. Three of these will be installed at once, and the fourth within a short time.

E. R. LeFevre, L. L. Herzberg, E. T. Hollingsworth, J. D. Dunlap, T. S. Kyle and Charles P. Smith, all of Gadsden, Ala., have applied for a franchise to distribute electricity in that city. Plans have not yet been completed, but it is the intention to construct a hydro-electric development for the generation of 20,000 horsepower.

## Miscellaneous

An electric power hoist is to be installed at the Kossuth Mine, Nevada City, Cal.

Two electric elevators will be purchased by the Chattanooga, Tenn., Feed Co. for installation in a grain elevator, which it is erecting. The elevators are to have a capacity of two tons each.

Somers, Fitler & Todd Co., Pittsburg, have received a contract from the Brookville Water Co., Brookville, Pa., for Dean steam pumps to be installed in the extension to the present plant.

The Pittsburg Coal Co. has awarded a contract to the Colangelo & Sons Construction Co., Latrobe, Pa., for a one-story brick and reinforced fan house for the Wick Haven mine and a fan house of similar design for Banning No. 1 mine.

A contract has been awarded to the Penn Machinery & Equipment Co., Pittsburg, for four Best, oil burning, rivet heating furnaces for construction work on the Panama canal. The furnaces are equipped with individual motor-driven blowers, each having a daily capacity of 2,500 rivets.

The Ingram-Richardson Mfg. Co., Beaver Falls, Pa., has purchased a 300-horsepower Buckeye engine, direct connected to a Crocker-Wheeler generator, to be installed at its present power plant for the operation of machinery being installed in its new addition to the Beaver Falls, Pa., plant.

Bids have been received by Andrew McMasters, architect, Pittsburg, and a contract will probably be awarded next week for an addition to the power plant for the Allegheny county home, at Woodville, Pa. The new equipment will include boilers, high-speed engines and a direct connecting 150-kilowatt generator.

The Bury Compressor Co., Erie, Pa., has about completed work on the extension to its plant and reports that sales of motor-driven machines, steam-driven machines and belt-driven machines during the past month have been heavier than for any single month in the history of the company. Shipments during the past months include 11 machines of different sizes to Colorado, Utah and Mexico.

A contract has been awarded by the Berwind-White Coal Mining Co., Windber, Pa., to the Pittsburg Gage & Supply Co., Pittsburg, for five duplex type White Star oil filters, especially designed for use in connection with the continuous oiling systems. The company has also received contracts for similar equipment from the Bethlehem Steel Co., Republic Iron & Steel Co., Minneapolis Steel & Machinery Co., and the Vulcan Iron Works.

Contracts have been awarded to the Westinghouse Machine Co. and the Westinghouse Electric & Mfg. Co., by the New York, New Haven & Hartford Railroad Co., for steam turbines, electric generators and 15 electric locomotives, representing an expenditure of about $1,000,000. All of this apparatus will be manufactured at East Pittsburg. The apparatus included in this new order will not only be used for operation on the main line, but also for the Harlem river division, the New York, West Chester & Boston and for the Mamaroneck, White Plains & Tarrytown line. The Westinghouse Machine Co. will furnish the turbine equipment, consisting of four 4,000-horsepower machines, while the generators and locomotives will be supplied by the Westinghouse Electric & Mfg. Co.

## Government News

### Navy Supplies.

Bids opened at the bureau of supplies and accounts, navy department, Washington, May 16, were as follows:

METAL FURNITURE. — Ship's outfit of metal furniture as specified: H. W. Andrews, New York, $91,797; Art Metal Construction Co., Jamestown, N. Y., $47,613.10; O. M. Edwards Co., Syracuse, N. Y., $42,274.50; General Fireproofing Co., Youngstown, O., $55,884.16 and $54,310.77; Hale & Hillburn Mfg. Co., Philadelphia, $53,337.38; Arthur S. Miller Co., New York, $92,545; Van Dorn Iron Works, Cleveland, $53,861.60.

FORGING PRESS.—One 600-ton high-speed hydraulic forging press for installation in smithery: Bethlehem Steel Co., South Bethlehem, $21,210 and $18,500; Camden Iron Works, Camden, N. J., $11,750 and $9,800; Lestra Machine Co., Pittsburg, $12,690; Manning, Maxwell & Moore, New York, $13,200 and $11,000; United Engineering & Foundry Co., Pittsburg, $14,450.

IRON PIPE.—4,000 feet (about 40 tons) iron pipe, as specified: Camden Iron Works, Camden, N. J., $1,643.97; Chris Froelich Co., San Francisco, $1,649.02; Glamorgan Pipe & Foundry Co., Lynchburg, Va., $1,608.20; R. H. Gray, San Francisco, $2,039.65; E. F. Kirwain Co., Baltimore, $1,669.45; American Cast Iron Pipe Co., San Francisco, $1,648.29.

IRON PIPE.—Miscellaneous iron pipe and fittings for shipment in Guam: Crane Co., San Francisco, $96.31; Dalzell Motor Co., San Francisco, $158.65; R. H. Gray, San Francisco, $201.76; E. F. Kirwain Co., Baltimore, $395.15.

PIG LEAD.—3,500 pounds soft lead in pigs, and 30 feet (150 pounds) lead pipe, 4 inches diameter, 5 pounds per foot, for shipment to Guam: Berry & Aikens, Philadelphia, $238.82; R. H. Gray, San Francisco, $260; E. F. Kirwain Co., Baltimore, $201.88; Selby Smelting & Lead Co., San Francisco, $180.04.

PORTLAND CEMENT.—575 barrels (about) Portland cement: Atlas Portland Cement Co., New York, $1.61 per barrel; Columbia Granite & Dredging Co., Washington, $1.57; W. W. Clark & Sons, Washington, $1.66; Copeley Cement Mfg. Co., Philadelphia, $1.21; National Mortar Co., Washington, $1.15; National Electric Supply Co., Washington, $1.09; Rosslyn Supply Co., Rosslyn, Va., $1.14.

STEEL FROGS.—Four solid cast steel frogs for 100-pound crane track rail and 70-pound standard gage rail: Barber Stockel Co., Cambridge, Mass., $135; United Portland Cement Co., Pittsburg, $109 and $144.

BRASS ROD.—22,500 pounds brass rod in commercial lengths, as specified: Biddle Hardware Co., Philadelphia, $3,306; Jas. Clendenin Co., Baltimore, $3,199.38; U. T. Hungerford Brass & Copper Co., New York, $3,306; J. H. Jolly & Co., Philadelphia, $3,145.50;

E. F. Kirwain Co., Baltimore, $3,615; National Brass & Copper Tube Co., New York, $2,868.75; Rome Brass & Copper Co., Rome, N. Y., $3,108.57; A. P. Swoyer Co., Philadelphia, $3,306; Scovill Mfg. Co., Waterbury, Conn., $3,081.

BRONZE ROD.—37,700 pounds (about) naval rod bronze, as specified: Ansonia Brass & Copper Co., New York, $5,015.60; National Brass & Copper Tube Co., New York, $6,984; Taunton-New Bedford Copper Co., New Bedford, Mass., $5,389.30; A. P. Swoyer, Philadelphia, $6,014.

COPPER.—125,000 pounds best Lake Superior refined copper in ingots between 9 and 12 inches in length: American Metals Co., New York, $0.1225 per pound; Biers, Sondheimer & Co., New York, $0.1212; Jas. Clendenin, Baltimore, $0.1218; Nassau Smelting & Refining Works, New York, $0.1219; the United Metals Selling Co., New York, $0.1225 and $0.12125; L. Vogelstein Co., New York, $0.1223.

PLOW STEEL ROPE.—2,200 feet ⅞-inch rope and 3,000 feet ⅝-inch rope, plow steel, extra flexible, 6 strands, hemp heart, 37 wires to the strand: Barber & Ross, Washington, $726; Broderick & Bascomb Rope Co., St. Louis, $717.50; J. M. Dodge Co., Nicetown, N. Y., $713; E. F. Kirwain Co., Baltimore, $963; A. Lescher & Sons Co., St. Louis, $620.22; Mascomb-White-Moon Co., New York, $674; John A. Roebling's Sons Co., Trenton, N. J., $700; Waterbury Co., New York, $665.26.

GUN PARTS.—One oil tempered, recoil cylinder, rough bored, turned to finish, as per specifications: Bethlehem Steel Co., South Bethlehem, $30; Midvale Steel Co., Philadelihap, $30.

STEEL CASTING. — One one-slide, right hand (steel casting) as per piece No. 2, blue print No. 33265: American Steel Foundries Co., Chester, Pa., $0.0473 per pound; Baldt Steel Co., New Castle, Del., $0.0464; Bethlehem Steel Co., South Bethlehem, $0.52; Federal Steel Foundry Co., Chester, Pa., $0.0414; Midvale Steel Co., Philadelphia, $0.095; Pittsburg Steel Foundry Co., Pittsburg, $0.06.

FORGED STEEL.—30,000 pounds (about) in commercial lengths: Bethlehem Steel Co., South Bethlehem, $0.02645; Crucible Steel Co., Pittsburg, $0.0280; Carnegie Steel Co., Philadelphia, $0.0517; J. B. Kendall Co., Washington, $0.03645; Philadelphia Steel & Forge Co., New York, $0.03; Pittsburg Forge & Iron Co., Pittsburg, $0.0385; M. W. Siderquist, Boston, $0.0344.

## Lincoln Becomes Chairman

Robert Todd Lincoln, son of President Abraham Lincoln, presented his expected resignation May 18 as president of the Pullman Co., at a meeting of the directors in Chicago, and was elected chairman of the board. John Sumner Runnels, vice president and general counsel of the company, was elected president. Charles S. Sweet, who has been assistant to Mr. Lincoln, was elected assistant to President Runnels. Mr. Lincoln, who is retiring from active office on account of ill-health, has been president of the Pullman Co. since the death of George M. Pullman, in 1897. Mr. Runnels has been general counsel of the company since 1887 and has been vice president since 1905.

The Railway Steel Spring Co. has declared the regular quarterly dividend of 1¼ per cent on preferred stock, payable June 20.

The National Lead Co. has declared the regular quarterly dividend of three-quarters of 1 per cent on common stock, payable June 30.

## WORDS OF PRAISE

### For the Steel Corporation—Growth of Its Foreign Business.

In the discussion in the national house of representatives of the Stanley resolution providing for an investigation of the United States Steel Corporation, Mr. Austin, of Texas, spoke in part as follows:

Now, gentlemen, if we are to inaugurate a war upon every movement looking to a consolidation of the manufacturing interests in this country, we are not only going to embarrass and injure our manufacturing development, but we are going to drive out of the field of investment men who have the needed money to carry forward the industrial development of our country and keep busy an immense army of wage earners. I believe in the proper and just control of every trust or combine or corporation, but I do not believe in carrying that control to a point that means not only destruction to the invested millions of our American citizens, but curtailing the output of the mill, the mine, and the factory.

This Corporation that we are now seeking to investigate last year turned out and sold more than $750,000,000 of manufactured goods. When it was originally organized its export business was valued at $2,000,000. Last year it had so developed and extended its splendid foreign business, under James A. Farrell, that its exports had grown to almost $100,000,000. An increase from $2,000,000 to $100,000,000 means something when it comes to measure this additional prosperity in America. A hundred million dollars in foreign exports and $650,000,000 goods sold in our home market means wages — employment for more than 200,000 American workingmen.

Now, gentlemen on both sides of this chamber talk about "competition." Why, gentlemen, the time of "cut-throat" competition among sensible business men has long since passed away, and if we by legislation seek to force a return to that era then we will not only silence thousands of mills in this land today, but we will prevent the future investment of millions in the development of our resources and in the conduct of our commercial and manufacturing affairs.

I am a southern representative on the floor of this house. I do not complain at the purchase of the Tennessee Coal, Iron & Railroad Co. by the United States Steel Corporation, for it has not proven to be an injury to the south. It has been a great benefit. I say that statement can not be challenged, and the chairman of the committee on ways and means, the gentleman from Alabama (Mr. Underwood), in whose district this great Corporation is largely interested, will not say that the absorption of that plant by the Steel Corporation has not brought millions for the improvement and the extension of an almost bankrupt, crippled corporation, giving it new life.

The members of the investigating committee as elected by the house are as follows: Representatives Stanley, Kentucky, chairman; Bartlett, Georgia; Ball, Texas; Littleton, New York; McGillicuddy, Maine; Olmsted, Pennsylvania; Young, Michigan; Sterling, Illinois, and Danforth, New York. Congressman Olmsted, of Harrisburg, Pa., asked to be excused from serving. He stated that the Pennsylvania Steel Co. is located in his district, and to avoid any appearance of partiality, he though it best to have the investigation made by others than himself.

## Completes New Plant

The J. W. Paxson Co., Philadelphia, is completing a new plant covering an area of 9,000 square feet, which will be equipped for the manufacture of foundry supplies, including riddles, wire, bristle and split bamboo brushes and brooms, boiler tubes and flue cleaning brushes, foundry bellows, pattern letters and figures. The building is of concrete and steel construction and has a saw-tooth roof. In addition to this plant the company operates shops for the manufacture of foundry equipment, pattern and blacksmith shops, etc.

The Gaston Iron Works, Inc., Gastonia, N. C., advising respecting its recent incorporation, says that it has purchased the business of B. Frank Norris, who has been operating the Gaston Iron Works. Mr. Norris has just completed some new construction, so that no additional building will be undertaken for some time. Some additional tools will be purchased a little later, but possibly not before fall. The company plans a general foundry and machine shop, for which it is well situated, its specialty being cotton mill castings, but it also makes a specialty of grate bars for furnaces.

The Anderson Steel Furnace & Boiler Works, Salem, Ore., which was incorporated in January, to take over the business of E. K. Anderson, advises that it is now established in a plant of its own. A quantity of new equipment has been installed. The officers are: President, E. K. Anderson; vice president, F. A. Anderson; treasurer, B. Anderson; secretary and attorney, W. E. Vincent.

The G. E. Hoglund Foundry Co., Gardner, Mass., is erecting a steel and concrete foundry, 40 x 100 feet, which will be ready for operating about Oct. 1. All kinds of machinery castings will be made in it. The necessary equipment is purchased.

# POINTERS ABOUT NEW BUSINESS

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

**New Buyers:—**

The following manufacturing companies have filed articles of incorporation:

The Christie Architectural Iron Co., East St. Louis, Ill.; $2,500; by E. Christie and H. A. Christie, East St. Louis, Ill.

The Detroit Metal Drawing & Rolling Co., Detroit; $10,000; by Hugo Neuman, Charles Kleim, and Anthony Grosfield.

The Eureka Steel Co., Pittsburg; $25,000; by John J. Rattiga, George B. Smith, George D. Hutson, all of Homestead, Pa.

The Kerwin Machine Co., Detroit, Mich.; $100,000; by John J. Kerwin, Frederick W. Chathom, Bertha H. Siewart, Joseph R. Was, and Thomas J. Murphy.

The Bureau Stove Co., Richmond, Va.; $50,000; by G. M. Smithdeal, president; Preston Cobb, vice president; Joseph P. Sadler, secretary and treasurer.

The United Engine & Mfg. Co., York, Pa.; $20,000; Robert E. Manley, 505 Madison avenue, William D. Himes, New Oxford, Pa., O. S. Trone, Hanover, Pa.

The Massillon Wire Basket Co., Massillon, O.; wire baskets and novelties; $25,000; by John E. Johns, C. E. Schworn, Martin B. Schultz, Andrew Reese, and George W. Kratsch.

The Woolston Mfg. Co., Trenton, N. J.; $50,000; by William Woolston, Fred Woolston, both of Trenton, and Elmer E. Wyckoff, New Brunswick; to manufacture iron, steel and other metals.

The Victor Iron & Furnace Co., St. Louis; to operate blast furnaces, foundries, etc.; $50,000; by William H. Ballman, William A. Chambers, L. W. and M. L. Brown, and G. L. Graham.

The Talbot Construction Co., East Orange, N. J.; $20,000; to engage as mechanical and general engineer, brass founder, etc.; by Jerome D. Gedney, Stanley L. Gedney Jr., and David A. McBride.

**New Construction:—**

The Great Northern railroad, it is stated, is planning to build repair shops at Whitefish, Mont.

The Indiana Rolling Mill Co., Newcastle, Ind., will rebuild the shovel works recently badly damaged by fire.

The Star Foundry Co., Albert Lea, Minn., is planning to erect a concrete building, 60 x 160 feet, this summer.

The Standard Oil Co. is erecting new machine shops and an extensive asphaltum plant at its Richmond, Cal., works.

The Gilbert & Bennett Mfg. Co., Georgetown, Conn., advises that it is erecting a building, 40 x 125 feet. The company manufactures wire goods, wire cloth, etc.

The Northwestern Malleable Iron Co., Milwaukee, Wis., has been granted a permit to build a two-story shop, 83 x 196 feet, on the north side of Park street, near Thirteenth avenue, to cost $42,000.

The Milwaukee Electric Railway & Light Co. has submitted to the city building inspector plans for repair shops, estimated to cost $90,000. One, a two-story building, will be 180 x 370 feet, of steel and concrete.

The McDonnell Boiler & Iron Works, Des Moines, Ia., advising respecting its recently noted fire, says that it has rebuilt its foundry, it not being as badly damaged as stated in the daily press reports.

The Ohio Valley Brass & Iron Co., represented by J. V. Kennedy, of Cleveland, has entered into an agreement with the board of trade in Mingo Junction, O., to erect a foundry at Deandale, which, it is estimated, will employ 350 men.

The Western Tool & Mfg. Co. has been incorporated and will erect a factory at Oakland, Cal. The incorporators are W. A. Sturgeon, J. H. Rackerby, J. W. Howard and A. J. Sturgeon. The offices of the company are at 957 Broadway, Oakland, Cal.

President Howard A. and Secretary Fred H. Fitch, of the Kansas City Structural Steel Co., are projecting a structural steel plant for Houston, Tex., at an estimated cost of $200,000. The Houston chamber of commerce reported favorably on the project. The new company will be known as the Texas Steel & Iron Co.

The Lincoln Stove & Range Co., Fremont, O., is in process of reorganization and refinancing, according to advice from Mozart Gallup, president, Sandusky, O. More extensive facilities for the production of stoves and ranges, for gas and other fuels, are to be provided.

Trebert Gas Engine Co., Butler, Ind., which is planning to remove to Terre Haute, advises that a contract was closed, May 13, for its proposed building in the latter city. It has not fully decided on the new machinery to be installed, but this will be considered later, since it has a fair amount of equipment in the Butler shops.

The Crane Valve Co., through its consulting engineer, the Hooper-Falkenau Engineering Co., 165 Broadway, New York City, has let a contract to W. H. Boardman Co., New York City, for the construction of a heavy machine shop, 50 x 353 feet, to be erected at Bridgeport, Conn. It will be equipped with traveling cranes, etc. The work of designing, submitting and accepting bids for this building was accomplished entirely in two weeks.

The Everhart-Delaney Co., of Oshkosh, Wis., recently incorporated with a capital stock of $150,000, has commenced construction work on a plant for the production of drop forgings. It will be 40 by 90 feet, one story. The Milwaukee Bridge Co. has the contract for the construction work. The plant will be ready about June 15. The corporation has elected officers as follows: President, Charles M. Delaney, Poynette, Wis.; first vice president, H. D. Delaney, Poynette; second vice president, Samuel B. Everhart, Berlin, Wis.; secretary, C. W. Everhart, Oshkosh; treasurer, Floyd Samuel Everhart, Oshkosh.

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**General Industrial:—**

The General Foundry Co., Warren, O., has reduced its capital stock from $100,000 to $58,000.

Union Steel Casting Co., Pittsburg, has increased its capital stock from $1,500,000 to $2,500,000.

The Wellman Pattern Supply Co.,

Cleveland, has increased its capital stock from $30,000 to $50,000.

National Stamping & Electric Works, Chicago, has filed notice of increase in capitalization from $35,000 to $50,000.

The Star Brass Works Co., Kansas City, Mo., advises that the purpose of its recently increasing its capital stock is to enable the company to carry a large stock of goods on hand which it is manufacturing.

The Ludlow-Saylor Wire Co., St. Louis, advising respecting its recently noted increase of capital stock says that this is to provide for the general needs of the business, and not for any specific improvement.

E. M. Hall, vice president of the Henshaw Bulkley Machinery Co., of San Francisco, has been installed as temporary manager of the firm by the creditor's committee pending the settlement of the company's financial troubles.

The Sharon Iron & Metal Co., Sharon, Pa., recently organized by the election of the following officers: President, Horace W. Davis; vice president, Glen Carley; secretary, George H. Allen; treasurer, H. B. McDowell, the directors including the officers and Charles W. Foster.

Christopher & Simpson Architectural Iron & Foundry Co., St. Louis, advising respecting the recently noted purchase of additional property at Eighth and Rutger streets, says that the property adjoins its present structural steel shops and was bought to provide for future extensions. In the meantime it is carrying the purchase as an investment merely.

The defunct Republic Belting Co., Cleveland, which was placed in the hands of a receiver about two months ago, has been purchased by the Graton & Knight Mfg. Co., Worcester, Mass. James D. Thompson, Cleveland manager of the company, will have charge of the Republic plant, which will be operated as a factory branch, making leather supplies and belting.

The Southern Car Co., High Point, N. C., will enlarge the works by the construction of additional buildings of brick and steel, including a dry kiln building, 25 x 80 feet. The company has been reorganized by the election of these officers: President, J. Elwood Cox; vice president, Waldo Morrison; secretary-treasurer, Abram Cook; general manager, E. T. Robinson.

At the annual meeting of the Detroit Steel Casting Co., held May 11, reports were read showing that the year just closed has been an unusually prosperous one, and that, while business is quiet, and booking of orders is very slow, the prospects for the coming year are considered good. The following officers were re-elected: President, J. S. Newberry; vice president and general manager, S. W. Utley; secretary, W. S. Allen; treasurer, F. P. Smith; assistant treasurer, J. P. Warren.

The Mahony Boiler & Radiator Co., of Green Island, N. Y., has been incorporated with a capital stock of $75,000, by Albert C. Mahony, George H. Sandholt, of Green Island, and George L. Tobin, of Coeymans, N. Y. The company, having outgrown its plant at Troy, has purchased a factory building at Green Island, to which it will remove its equipment. The plant will be enlarged and additional machinery installed. The output will include boilers, radiators, school house heaters of large type, Cooper generators and cookers for coal, gas and oil.

The Johnston Harvester Co., Batavia, N. Y., has commenced work on the construction of two new buildings, each approximately 70 x 500 feet, to be used for increasing the capacity of the malleable iron department. Practically all the needed equipment has been arranged for. The company has also decided to erect a four-story building, 80 x 500 feet, to be used for general manufacturing. The Johnston company is now controlled by the Massey-Harris Co., Toronto. The main product of the Johnston company will continue to be agricultural implements.

The Johnson-Morse Can Co., Wheeling, W. Va., which was recently incorporated with $1,000,000 capital, has acquired the Wheeling Can Co. and the LaCrosse Can Co., and will remove the plant of the latter from LaCrosse, Wis., to Wheeling. It will erect an additional building south of the present Wheeling plant, three stories, of brick and steel, which it will equip with machinery for manufacturing pails, oil cans, etc. The officers of the company are: President, Oliver J. Johnson; vice president, A. A. Morse; treasurer, A. C. Whitaker; consulting engineer, F. A. Hastings, all of Wheeling.

The United Iron & Steel Co., Houston, Tex., which was recently organized with a capital stock of $150,000, has the following officers: President, I. N. Willard of Utica; secretary and treasurer, J. B. Hine, Syracuse; while among the directors are, F. W. Barnes, of Pittsburg, and N. F. Mills, of Houston. The company has bought 20 acres on a portion of which it will erect a main building 60 x 200 feet, with additions for boiler and engine houses. It will turn out merchant iron and steel, using old steel rails and scrap. The company has also purchased a red hematite ore tract in Cherokee county, Tex., but will hold this in reserve.

The Shirley Radiator & Foundry Co., Shirley, Ind., which is being operated by the Union Trust Co., of Indianapolis, as receiver, recently purchased additional ground and has just completed extensions to its plant which will more than double its capacity. The equipment, for making both boilers and radiators, has been increased, additional assembling machines, boring machines, sand blasts, etc., having been installed. An industrial railway has been extended throughout the plant and is used in transporting hot iron as well as the finished products in the various stages of their manufacture. Additional warehouses have been built and shipping facilities increased so that ten cars may now be loaded simultaneously without interfering with inbound freight. C. E. Gates was recently elected general manager of the company.

Reynolds Pattern & Machine Co., Moline, Ill., is a consolidation of the Tri-City Pattern & Machine Co. and Reynolds Machine Co. The Tri-City company has been doing a general pattern and machine business, while the Reynolds company has been building screw-driving machines and gear hobbing machines. Both these lines will be continued and in addition several new machines will be placed on the market shortly. It has purchased the machinery, tools and other equipment of the Muscatine Motor Co., of Muscatine, Ia., and has moved it to Moline, where it will be installed, together with the Reynolds company's equipment, in the building heretofore occupied by the Tri-City company, 40 x 100 feet, brick and mill construction, two stories and basement. It expects to install later an autogenous welding plant.

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**Trade Notes:—**

Homestead Valve Mfg. Co., Pittsburg, has appointed E. D. Morton & Co., Louisville, Ky., its agents for that city and its vicinity. Morton & Co. will carry a complete line of Homestead valves to supply immediate demands.

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**Fires:—**

The Boonton, N. J., works of the Boonton Iron & Steel Co. were badly damaged, May 12, the loss being estimated at $25,000. The adjoining building of the General Foundry Co. was also damaged at the same time.

The shops of the Reliance Fire Proof Door Co., the George M. Ball Works, and the New York Gear Co., New York City, were seriously damaged, May 16, the combined loss being estimated at $50,000.